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**Program Product**

**MVS/System Product  
Version 1 General  
Information Manual**

**MVS/System Product:  
JES3 Version 1 5740-XYN  
JES2 Version 1 5740-XY5**



### **Thirteenth Edition (March 1985)**

This is a major revision of, and obsoletes, GC28-1025-11. See the Summary of Amendments following the Contents for a summary of the changes made to this manual.

This edition applies to all releases of Version 1 of OS/VS2 MVS/System Product-JES3 (Program Number 5740-XYN) and OS/VS2 MVS/System Product-JES2 (Program Number 5740-XY5). Changes are made periodically to the information herein; before using this publication in connection with the operation of IBM systems, consult the latest *System/370 Bibliography*, GC20-0001, for the editions that are applicable and current.

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# Preface

This publication contains overview and planning information for all releases of Version 1 of MVS/System Product-JES3 (Program Number 5740-XYN) and MVS/System Product-JES2 (Program Number 5740-XYS). It is intended for installation managers, system programmers, and IBM personnel who are considering installing one of these products. Readers should have a background in OS/VS2 MVS.

Throughout the rest of this document, when referring to both MVS/System Product-JES3 and MVS/System Product-JES2 or topics common to both program products, the products will be referred to as the MVS/System Product or MVS/SP.

The major topics of this document by section are:

- Introduction - highlights the enhancements provided by MVS/System Product-JES3 and MVS/System Product-JES2.
- MVS/System Products Functional Summary - describes the individual enhancements provided in MVS/System Product-JES3 and MVS/System Product-JES2.
- Planning Information - describes the machine and programming requirements, storage requirements, and compatibility considerations for MVS/System Product-JES3 and MVS/System Product-JES2.
- Publications Ordering Information - lists the publications available with each release of MVS/System Product.



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# Summary of Amendments

## Summary of Amendments for GC28-1025-12

Changes to this publication are:

- Information concerning the MVS/System Product Version 1 Release 3.4 is updated.
- Information concerning the MVS/System Product Version 1 Release 3.5 is added. This information is as follows:
  - Support for the IBM 3090 model 200 processor in System/370 mode
  - Support for deallocation of frames with double-bit errors
  - Stand-alone dump enhancements
  - Global resource serialization enhancements

## Summary of Amendments for GC28-1025-11

Changes to this publication are:

- Information concerning the MVS/System Product Version 1 Release 3.1 is updated as follows:
  - Console-buffer constraint relief in JES3
  - JES3 support for DOS/VSE PNET
  - JES3 support for the 3800 Printing Subsystem Model 3 in compatibility mode
- Information concerning the MVS/System Product Version 1 Release 3.4 is updated as follows:
  - Support for 3480 Magnetic Tape Subsystem
  - Support for 4248 Printing Subsystem
  - Planning information for JES3 Release 3.4 is added
  - A list of new and changed modules and macros for JES3 Release 3.4 is added
  - A list of publications and microfiche for JES3 Release 3.4 is added

**Summary of Amendments  
for GC28-1025-10**

This edition contains changes to the publications listed in Chapter 4.

## Chapter 1. Introduction

OS/VS2 MVS/System Product-JES3 (MVS/SP-JES3) and MVS/System Product-JES2 (MVS/SP-JES2) both provide common enhancements to the MVS base control program and include all the functions previously provided by MVS/System Extensions (Program Number 5740-XE1). Additionally, MVS/System Product-JES3 contains JES3 enhancements and MVS/System Product-JES2 contains JES2 enhancements.

The content of each release of Version 1 of the MVS/System Product is described below.

- **Release 1** contains base control program enhancements and supersedes MVS/System Extensions Release 2.
- The **Release 1 Enhancement** contains base control program enhancements and requires MVS/SP Release 1 as a prerequisite.
- **Release 3** contains base control program and either JES2 or JES3 enhancements and supersedes MVS/SP Release 1 and the Release 1 Enhancement.
- **Release 3.1** contains base control program and JES3 enhancements.
- **Release 3.2** contains base control program enhancements.
- **Release 3.3** contains base control program, IPCS, and JES2 enhancements.
- **Release 3.4** contains either JES3 or JES2 enhancements.
- **Release 3.5** contains base control program enhancements.

All releases of the MVS/System Product Version 1 require OS/VS2 MVS Release 3.8 with Processor Support 2 and can be installed on the following:

- System/370 Models 158 and 168 with the System/370 Extended Feature
- 3031, 3032, and 3033 processors with the System/370 Extended Facility
- 4341 processors with Extended Control Program Support Facility for MVS
- 4361-5 processor
- 4381 processor
- 3033/3042 attached processor complex
- 3081 processor complex
- 3083 processor complex
- 9081 processor complex
- 9083 processor complex
- 3084 processor complex

*Note:* MVS/SP Release 1 supports the 308x and 908x processors only if the Release 1 Enhancement is installed.

Release 3 and subsequent releases of MVS/System Product support the 3033 Extensions feature which is optional on 3033 UP, MP, and AP processors (including model groups N and S), and the optional 3031 microcode engineering change on 3031 UP and AP processors.

Release 3.5 of MVS/System Product supports the IBM 3090 model 200 processor.

This section contains highlights of the enhancements provided by the MVS/System Product.

## MVS/System Product Release 1

Release 1 of the MVS/System Product contains all the functions previously provided by MVS/System Extensions plus the following MVS base control program enhancements:

- Support for the IBM 3380 Direct Access Storage device and the 3880 Storage Control Models 2 and 3. This support requires the MVS/370 Data Facility Product program product (5665-295) or the OS/VS2 MVS Data Facility Device Support program product (5740-AM7).

*Note:* The 3380 and 3880 are supported by MVS/370 Data Facility Product program product (5665-295) beginning with MVS/SP Version 1 Release 3 for both JES2 and JES3.

- Support for the IBM 4341 Processor.
- Support for the IBM 3278/3279 Display Stations as multiple console support (MCS) consoles.
- Support for improved VTOC information access by means of an index to the VTOC, and direct access device space management (DADSM) installation exits. This support requires the MVS/370 Data Facility Product program product (5665-295) or the OS/VS2 MVS Data Facility Device Support program product (5740-AM7).

*Note:* The indexed VTOC and DADSM installation exits are supported by MVS/370 Data Facility Product program product (5665-295) beginning with MVS/SP Version 1 Release 3 for both JES2 and JES3.

- New RAS function.
- Support for the event notification facility (ENF).
- IODEVICE system generation statement enhancements that allow the specification of the OPTCHAN keyword for any device (e.g. 3270 terminals).

The MVS/System Extensions functions included in Release 1 of the MVS/System Product are:

- Enhanced system control through system resources manager (SRM) facilities.
- Additional system programmer capability in terms of enhanced supervisor services and an IPL option.
- Improved system RAS in terms of improvements to storage protection and dynamic address translation.
- Retention of messages that require operator action.
- Control over performance group assignment.
- Subsystem transaction reporting.
- Improved collection of installation management data.

*Note:* MVS/SP Release 1 contains no JES2 or JES3 enhancements. MVS/SP-JES2 Release 1 supports JES2 Release 4.1 or NJE for the JES2 Release 3 program product (5740-XR8), with or without the 3800 enhancements, and MVS/SP-JES3 Release 1 supports JES3 Release 3 including the networking PRPQ (5799-AZT) with or without the 3800 enhancements.

## **MVS/System Product Release 1 Enhancement**

The MVS/System Product Release 1 Enhancement requires MVS/System Product Release 1 and contains the following base control program enhancements.

- Support for the IBM 308x (except the 3084) and 908x processor complexes.
- Support for the 3375 Direct Access Storage and the 3880 Storage Control Unit Models 1 and 2.
- Support for the 3880 Speed Matching Buffer for 3380 feature (#6550).

*Note:* The preceding two enhancements (concerning the 3375, 3880, and 3380) require the MVS/370 Data Facility Product program product (5665-295) or the OS/VS2 MVS Data Facility Device Support program product (5740-AM7). The 3375, 3380, and 3880 are supported by MVS/370 Data Facility Product program product (5665-295) beginning with MVS/SP Version 1 Release 3 for both JES2 and JES3.

# MVS/System Product Release 3

Release 3 of MVS/SP-JES3 and MVS/SP-JES2 contains all of the functions previously provided by Release 1 and the Release 1 enhancement plus the following enhancements:

## Base Control Program

- Cross memory services, an improved method of communication between address spaces.
- Global resource serialization, an extension of ENQ/DEQ/RESERVE facilities that provides the ability to serialize the use of symbolically-named resources between loosely-coupled systems using channel-to-channel adapters to communicate between systems.
- A facility that lets the installation suppress the display of nonessential messages on operator consoles.
- Enhanced DISPLAY U (unit) and DISPLAY A (active) commands that provide more explicit information in a condensed screen format.
- An improved facility for defining a subsystem during system initialization.
- A new facility for specifying which local paging data sets are not to be used for VIO pages.
- Improved subsystem usability and reliability.
- Performance improvements achieved through a combination of the 3033 Extension feature and Release 3 enhancements.
- Support for extended real addressing on 3033 UP, MP, and AP, 3081, and 3083 processors.
- RAS enhancements that reduce the system's vulnerability to errors and improve communication with the operator during recovery.
- Potential reduction of common service area (CSA) virtual storage use and enhanced RAS for the communications task resulting from the communications task's use of cross memory services.
- Improved support for the 3279 Color Display Station that aids the operator in differentiating among types of console messages (warning, action, information, and so forth).



## JES3

In addition to the base control program enhancements, MVS/System Product-JES3 Release 3 provides extensions to JES3 Release 3 together with the facilities provided by the JES3 Networking PRPQ (5799-AZT) and the JES3 3800 enhancements. MVS/SP-JES3 Release 3 includes:

- Spool processing enhancements that provide new spool RAS functions and support for the 3375 and 3380 DASDs as spool devices.
- Support to take advantage of the 3278/3279 as a JES3 console.
- An option that can reduce the amount of common service area (CSA) used by JES3.
- A networking facility that provides the capability to pass jobs and SYSOUT data between systems using NJE bisynch protocol or channel-to-channel adapters.
- A facility that allows the user to release completed tapes before a job creating a multi-file data set completes.

## JES2

In addition to the base control program enhancements, MVS/System Product-JES2 Release 3 contains all the functions of JES2 Release 4.1 and the NJE for JES2 Release 3 program product (5740-XR8) together with the facilities provided by the JES2 3800 enhancements. A major characteristic of MVS/SP-JES2 Release 3 is that it provides Network Job Entry (NJE) facilities as a standard feature. MVS/SP-JES2 Release 3 includes:

- Spool processing enhancements that provide support for the 3375 and 3380 DASDs as spool and checkpoint devices. This enhancements also provide for improved spool RAS and for ease of migration.
- A generalized user exit facility that allows the installation to insert installation code at IBM-defined exit points without modifying JES2 code, or at installation-defined exit points.
- Output processing enhancements that provide more information and control over the output.
- Remote Job Entry (RJE) enhancements that provide more system configuration and operation flexibility.
- Network Job Entry enhancements that improve the ability of JES2 to communicate with other systems.
- JES2 RAS improvements including improved command defaults, event trace enhancements, and an error recovery facility similar to the MVS ESTAE/FRR recovery scheme.

- Support for the 3800 Printing Subsystem Model 3 in compatibility mode. In this mode JES2 supports the 3800 Printing Subsystem Model 3 as if it were a Model 1. The full functional capability of the printing Subsystem is not utilized.

## MVS/System Product Release 3.1

Release 3.1 of MVS/SP-JES3 and MVS/SP-JES2 contains the following functions and enhancements:

### Base Control Program

- ASM enhancements to support the 3880 models 11 and 13.
- Support for the Interactive Data Transmission Facility of TSO Extensions (TSO/E) program product (5665-285).
- Support for the Multiple TCAM Facility of ACF/TCAM Version 2 Release 4 program product (5735-RC3).

### JES3

- Enhancements to the JES3 output writer that allow the JES3 global processor to make better use of tightly-coupled processors.
- RAS enhancements.
- Enhancements to operational characteristics.
- Support for the Interactive Data Transmission Facility of TSO Extensions (TSO/E) program product (5665-285).
- An enhancement to handle the out-of-storage error conditions in the JES3 address space.
- Support for DOS/VSE PNET (power networking) allows a JES3 complex to be part of a network that contains a DOS/VSE PNET node.
- Support to improve RAS when physical consoles can not keep up with the number of messages produced in the complex.
- Support for the 3800 Printing Subsystem Model 3 in compatibility mode.

*Note:* This support requires MVS/370 Data Facility Product Release 1.1 (or later) program product (5665-295).

*Note:* The JES3 component of MVS/SP Release 3.1 is a complete replacement of the JES3 component in Release 3.

## JES2

Release 3.1 of MVS/SP-JES2 does not contain any JES2 functional updates.

## MVS/System Product Release 3.2

Release 3.2 of MVS/SP provides the following enhancements:

### Base Control Program

- Support for the MVS/Operator Communications Control Facility (MVS/OCCF) in a JES2 environment.
- Scheduler enhancements, including dynamic allocation support for 3800 printer keywords.
- Support for tape labels that use ISO/ANSI/FIPS tape label support Version 3; this requires MVS/370 Data Facility Product program product (5665-295).
- Support of the 3279 Display Console Model 2C.

## JES3/JES2

Release 3.2 of MVS/SP does not contain any JES3 or JES2 functional updates.

Dormant JES3 and JES2 code activated by the base control program supports ISO/ANSI/FIPS tape label support Version 3. Additionally, JES3 users will need the JES3 ANSI Tape Support feature (5236/5237 - FMID JJS2351).

## MVS/System Product Release 3.3

Release 3.3 of MVS/SP provides the following enhancements:

### Base Control Program

Release 3.3 of MVS/SP contains no base control program functional updates.

## JES3

Release 3.3 of MVS/SP-JES3 does not contain any JES3 functional updates (JES3 remains at the Release 3.1 level.).

Dormant JES3 and JES2 code activated by the base control program supports ISO/ANSI/FIPS tape label support Version 3. Additionally, JES3 users will need the JES3 ANSI Tape Support feature (5236/5237 - FMID JJS2351).

## JES2

- An increase in the amount of spool space that can be defined in a spool configuration.
- Improvements to the usability and operational characteristics of JES2 output processing and its associated command processing.
- The ability to delete spool volumes without warm starts and with minimal impact to the normal processing of work.
- Additional methods for modifying JES2 processing including a scanning facility, a user control block, and eleven new user exits.
- Enhancements to JES2 initialization processing.
- Enhanced usability of secondary job entry subsystems.
- Standardized use of SMF.
- Improved handling of remote messages.
- Support for the 3800 Printing Subsystem Model 3 in compatibility mode.

*Note:* The JES2 component of MVS/SP Release 3.3 is a complete replacement of the JES2 component in Release 3.

## MVS/System Product Release 3.4

Release 3.4 of MVS/SP provides the following enhancements:

### Base Control Program

Release 3.4 of MVS/SP contains no base control program functional updates.

## JES3

- Increased JES3 spool capacity (up to 1024 spool volumes can be used) and greater control over the allocation of spool space and the contents of spool partitions.
- A spool maintenance facility that allows installations to control the contents of the output service hold queue.
- A duplicate checkpoint data set for improving the reliability, availability, and serviceability.
- Improved handling of defective tracks on spool data sets.

- Options to run JES3 converter/interpreter (C/I) processing outside the JES3 global address space in a separate functional subsystem address space in the local or global processors; this option can relieve virtual storage constraints in the JES3 global address space.
- Extensions to C/I limit processing that give installations additional control over the contents of JES3 private storage.
- Enhancements to procedure library update processing.
- Control over C/I processing for jobs submitted through the internal reader.
- Greater control over job output via the OUTPUT JCL statement.
- The ability to vary devices offline or online to both JES3 and MVS using either an initialization parameter or a single JES3 command.
- Enhancements to JES3 console support.
  - Support of the 3279 Display Station Model 2C as a JES3 console.
  - JES3 compatible multiple console support (MCS) using four color consoles and line intensification.
- Support for tape labels that use ISO/ANSI 3.27-1978 and the Federal Information Processing Standard (FIPS).

The JES3 ANSI Tape Support feature (5236/5237-FMID JJS2351) is no longer required.

- Support for the 3480 Magnetic Tape Subsystem and the MVS assign/unassign facility.

*Note:* 3480 Magnetic Tape Subsystem support requires the MVS/370 Data Facility Product program product (5665-295).

- Support for the 4245 and 4248 Printing Subsystems.
- A utility that allows the installation to detect and correct errors in an initialization stream before using the initialization stream to start JES3.
- Enhancements to the dump job facility so installations can save jobs when converting from JES3 Release 3.1 to Release 3.4 or from JES3 Release 3.4 back to Release 3.1.
- Support of the 3800 Printing Subsystem Model 3 in full-function mode.

*Note:* This support requires the Print Services Facility (program number 5665-275) and the MVS/370 Data Facility Product Release 1.1 (or later) program product (5665-295).

## JES2

- Support of the 3800 Printing Subsystem Model 3 in full-function mode.

*Note:* This full function mode support requires the Print Services Facility program product (5665-275) and the MVS/370 Data Facility Product Release 1.1 (or later) program product (5665-295).

- Support for the 4245 and 4248 Printing Subsystem.
- User modification enhancements through two new exits.
- Relief of virtual storage constraints in the JES2 private area.

## MVS/System Product Release 3.5

Release 3.5 of MVS/SP provides the following enhancements:

### Base Control Program

The BCP component of MVS/SP 1.3.5 contains the following:

- Support for the IBM 3090 model 200 processor in System/370 mode
- Support for frame deallocation to enhance reliability, availability, and serviceability (RAS)
- Stand-alone dump enhancements
- Global resource serialization enhancements

## JES3

Release 3.5 contains no JES3 functional updates.

## JES2

Release 3.5 contains no JES2 functional updates.

## **Chapter 2. Functional Summary of the MVS/System Product**

This chapter describes the functions provided by each release of Version 1 of the MVS/System Product.

### **MVS/System Product Release 1**

Release 1 of MVS/SP-JES3 and MVS/SP-JES2 contains all the functions previously provided by MVS/System Extensions plus the following base control program enhancements.

#### **The IBM 3380 Direct Access Storage Device**

MVS, with the installation of MVS/SP and either the MVS/370 Data Facility Product program product (5665-295) or the OS/VS2 MVS Data Facility Device Support program product (5740-AM7), supports the IBM 3380 Direct Access Storage device and the 3880 Storage Control Unit Models 2 and 3, with the Data Streaming feature on 3031, 3032, 3033, and 4341 processors. The dynamic path selection facility of the 3380 allows the system to access a shared 3380 along any available path to the device while the device is reserved to that system. Formerly, the operating system was restricted to one path when accessing a shared device reserved to that system.

*Note:* The 3380 and 3880 are supported by MVS/370 Data Facility Product program product (5665-295) beginning with MVS/SP Version 1 Release 3 for both JES2 and JES3.

#### **The IBM 4341 Processor**

MVS/System Product enables the OS/VS2 MVS operating system to run on the 4341 Processor with the Extended Control Program Support facility for MVS (ECPS: MVS) installed.

## **The IBM 3278 and 3279 Display Stations**

The 3279 Color Display Station (models 2A, 2B, 3A, and 3B), and the 3278 Display Station (models 1, 2, 2A, 3, and 4) are supported as MVS system operator consoles through device independent display operator console support (DIDOCS). Note, however, that this support requires that these consoles connect to non-SNA local attachments. The larger screen capacity is supported on the 3278 models 3 and 4 and on the 3279 models 3A and 3B. On the 3279 Color Display Station, action messages are displayed in white, non-action messages are displayed in blue, and the entry area is displayed in green. All program function keys (PFKs) present on each device are supported.

## **Improved VTOC Information Access**

This product, with either the MVS/370 Data Facility Product program product (5665-295) or the OS/VS2 MVS Data Facility Device Support program product (5740-AM7), provides improved VTOC information by means of an index to the VTOC (indexed VTOC) and direct access device space management (DADSM) installation exits. An indexed VTOC consists of an index structure over the volume table of contents, allowing reduced search time to access stored data.

## **The Event Notification Facility (ENF)**

An internal service, the event notification facility (ENF), provides a generalized protocol for event processing. When an IBM component detects a condition or performs a function that is defined as an event, it uses ENF to signal the occurrence of that event to the IBM components that are identified as listeners for that event.

## **RAS Function**

An ESTAE (extended specify task abnormal exit) macro parameter, TOKEN, is available to authorized programs. If an authorized program creates an ESTAE exit using the TOKEN parameter, the exit can be deleted only by using the same TOKEN value. Thus, the token form of ESTAE will help to prevent accidental deletions of ESTAE exits. Additionally, it provides a convenient method to clean up an ESTAE's exit stack. When the specified token is used on a cancel request, the system purges all ESTAE exits newer than and including the exit specified with the token.

## **IODEVICE OPTCHAN Enhancement**

The OPTCHAN keyword can now be specified on the IODEVICE system generation statement for any device (e.g., 3270 terminals) that is not connected to a byte multiplexer channel. This allows installations to take advantage of the 3814 Switching Management System.



# MVS/System Product Release 1 Enhancement

The Release 1 Enhancement of the MVS/System Product adds the following functions to those provided by Release 1 of the MVS/System Product.

## The IBM 308x and 908x Processor Complexes

The Release 1 Enhancement provides the following facilities in support of the IBM 308x (except the 3084) and 908x processor complexes:

- Reconfiguration Enhancements

Operator reconfiguration commands issued to MVS accomplish in one step, both logical and physical reconfiguration of channels, processors, and storage. This one-step reconfiguration replaces the two-step procedure of previous processors, where an MVS command performed logical reconfiguration and operator actions external to MVS performed physical reconfiguration.

In addition to physical reconfiguration, functions are provided that allow MVS to communicate with the processor controller. These functions are:

- The audible alarm, previously sounded via an I/O command directed to a 3036 console device, is now sounded by means of an internally issued program command to the processor controller.
- The 2955 simulator is replaced by a data communication link.

- I/O Configuration Program

IBM provides an I/O configuration program (IOCP) that an installation must use to describe its hardware I/O configuration to the processors' microcode. There are three versions of IOCP; one is supplied with the MVS System Product and executes as a job under MVS, one is a VM version that executes under CMS control, and one is supplied with the processor complex and executes as a stand-alone program. The output of the IOCP is loaded into control storage when the system operator performs a power-on reset or SYSIML CLEAR function.

For an MVS system generation, it is recommended that you combine the IOCP macro instructions with the MVS system generation macro instructions to form one combined input deck to be used by both IOCP and system generation. By using one combined input deck to MVS system generation and IOCP, you ensure that the definitions of your software and hardware I/O configurations are identical for a processor complex.

- Test Block

The test block instruction is used to test storage. If the storage is valid, test block clears it. MVS detects the failing blocks of storage at IPL and VARY ONLINE time and avoids using the failing blocks.

## **The IBM 3375 Direct Access Storage Device**

MVS/SP with the installation of the Release 1 Enhancement and either the MVS/370 Data Facility Product program product (5665-295) or the OS/VS2 Data Facility Device Support program product (5740-AM7), supports the 3375 Direct Access Storage device with the 3880 Storage Control Unit Models 1 and 2 on processors that have the Data Streaming Feature.

*Note:* The 3375 is supported by MVS/370 Data Facility Product beginning with MVS/SP Version 1 Release 3 for both JES2 and JES3.

## **The Speed Matching Buffer**

Support for the 3880 Speed Matching Buffer for the 3380 allows attachment of the 3380 Direct Access Storage Device on all processors supported with MVS/SP. This support requires either the MVS/370 Data Facility Product program product (5665-295) or the OS/VS2 Data Facility Device Support program product (5740-AM7).

*Note:* The 3880 Speed Matching Buffer for 3380 feature is supported by MVS/370 Data Facility Product program product (5665-295) beginning with MVS/SP Version 1 Release 3 for both JES2 and JES3.

## **JES Support**

MVS/SP Release 1 and the Release 1 Enhancement do not contain any JES enhancements. They are designed to operate with JES2 Release 4.1, JES2 NJE program product (5740-XR8), or JES3 Release 3.

## **MVS/System Product Release 3**

Release 3 of MVS/SP-JES3 and MVS/SP-JES2 provides all of the function of MVS/SP Release 1 and the Release 1 Enhancement and contains the following enhancements.

### **Base Control Program Enhancements**

#### **Cross Memory Services**

Cross memory services increase the efficiency of communication between address spaces as compared to the previous SRB and cross memory post methods by reducing the requirement for communicating through the common area. Cross memory services allow programs to pass control to programs in other address spaces and allow direct data movement between two defined address spaces. Cross memory services are transparent to the user.

Previously, MVS did not provide direct data movement between address spaces. Data to be moved or referenced between address spaces had to be placed in

common storage, which reduced the amount of common storage available for other uses.

Cross memory services, together with new auxiliary address spaces for some system components and subsystems, may potentially reduce the system virtual storage (nucleus, PLPA, SQA, CSA) requirements for specific environments. Some data formerly found in the system virtual storage is now stored in auxiliary address spaces and accessed using cross memory services. This may provide more system or private area virtual storage for other subsystems, new applications, or growth of current applications. Additionally, areas that previously were protected only by storage keys can now be protected by being isolated in a separate private address space.

Cross memory services are provided for all processors supported by the MVS/System Product. In addition, cross memory services can be implemented with:

- The 3033 Extension feature for 3033, 3081, and 3083 processors (a hardware/microcode implementation of cross memory services). This feature is optional on 3033 processors and standard on 3081 processors.
- The optional microcode engineering change for 3031 processors.

*Note:* The 3031 Engineering Change cannot run concurrently with: the OS/VS1 ECPS, the Virtual Interval Timer Assist (VITA), the Control Program Assist (CPA), Virtual Machine Assist (VMA), Shadow Table Bypass Assist, or the Extended Virtual Machine Assist (EVMA).

Most users will not use cross memory services directly, but will benefit from them through their use of system components and subsystems that do use the services. Functions that benefit from the use of cross memory services are:

- Global resource serialization

The use of cross memory services permits global resource serialization (described later in this chapter) to place ENQ/DEQ control blocks in the private area of a separate address space. This reduces common storage usage and provides RAS benefits.

- Console communications task

The communications task executes in its own address space and uses cross memory services to communicate with user address spaces and the master address space. The communications task control blocks for console support, write-to-operator messages, and console message queueing, previously located in the common service area (CSA), are now in the private area of the communications task address space.

- DISPLAY U

The additional information provided by the DISPLAY U enhancements (described later in this chapter) is collected in a separate address space and accessed directly using cross memory services.

- JES3

JES3 (JES3 enhancements are described later in this chapter) allows an installation to significantly reduce its use of common storage for buffers and staging areas by storing some of this data in the private area of a JES3 auxiliary address space and using cross memory services to access the data.

## Global Resource Serialization

MVS currently provides an ENQ/DEQ service to serialize resources within one MVS system and a RESERVE function to serialize resources among multiple systems. The RESERVE service achieves serialization among systems via a hardware RESERVE which prevents other systems from accessing the shared device containing the resource being reserved.

Global resource serialization is a functional extension to ENQ/DEQ that serializes the use of system resources among loosely-coupled systems using channel-to-channel adapters (CTCs) to communicate among the systems. With its ability to communicate among systems, global resource serialization provides the following benefits over the RESERVE macro instruction:

- The serialization level is reduced from a volume level to a resource level (Qname, Rname); more than one system can access different resources on the same volume concurrently.
- Different systems can concurrently access the same resource on a shared device as long as all systems request shared control of the resource.

Global resource serialization is a compatible replacement for the current ENQ/DEQ/RESERVE functions and can be used without changing existing programs. Global resource serialization recognizes the three serialization scopes (STEP, SYSTEM, and SYSTEMS) that a user can currently code on the ENQ/DEQ/RESERVE macros. When using global resource serialization, ENQ/DEQ requests specifying STEP or SYSTEM will be treated as requests for local resources (not serialized with other systems in the global resource serialization complex). ENQ/DEQ/RESERVE requests specifying SYSTEMS will be treated as requests for global resources (serialized by all systems in the global resource serialization complex).

Three exits allow existing ENQ/DEQ/RESERVE requests to take advantage of global resource serialization.

- An 'inclusion' exit receives control for each ENQ/DEQ request that specifies a scope of SYSTEM (local serialization) to determine if the installation wants the resource to be globally serialized. The exit scans an 'inclusion' resource name list (defined by the installation or an IBM-supplied default list) for the resource named on the ENQ/DEQ request. If the resource's name appears in the list, global resource serialization treats the request as a global resource request.

- An 'exclusion' exit receives control for each ENQ/DEQ/RESERVE request that specified a scope of SYSTEMS (global serialization) and for requests treated as SYSTEMS because the resource name was in the 'inclusion' list. If the resource named on the ENQ/DEQ/RESERVE appears in the 'exclusion' list of resource names (defined by the installation or an IBM-supplied default list), global resource serialization treats the request as a local resource request.
- A 'RESERVE conversion' exit receives control for each RESERVE request. This exit treats the RESERVE (1) as a global ENQ request if the resource name appears in a installation defined 'RESERVE conversion' resource name list, or (2) as a local request if the resource name appears in the 'exclusion' resource name list.

To provide easier access to internal ENQ control block information, global resource serialization provides a new macro (GQSCAN). GQSCAN allows a user to get information concerning a resource without having to access internal control blocks. User access to this control block information is only available using GQSCAN.

In the context of multi-system data set integrity, the conversion capabilities provided by global resource serialization can be used to provide a data set level of serialization for MVS/JES2 installations. For MVS/JES3 installations, global resource serialization is not intended to replace the data set level of serialization provided by main device scheduling (MDS). Rather, it is intended to complement it by allowing existing RESERVE requests to be converted into multi-system (global) ENQ requests circumventing the volume level of serialization inherent in the current RESERVE/RELEASE function.

***Establishing a Global Resource Serialization Complex:*** To serialize resources across systems, global resource serialization requires that the systems be connected using dedicated CTCs. To obtain maximum flexibility in defining the complex and recovering from errors, each system should be connected (via CTC) to every other system in the global resource serialization complex.

The SYS1.PARMLIB member (GRSCNFxx) defines which CTCs are to be used by the systems of the global resource serialization complex. The operator selects the desired GRSCNFxx member (which contains a list of CTCs), using the GRSCNF= parameter at 'specify system parameters' time.

The installation can specify whether or not a system is to participate in a global resource serialization complex by using a new parameter (GRS=) in an IEASYSxx SYS1.PARMLIB member. The operator can override this parameter at 'specify system parameters' time, but cannot change the parameter once the system is initialized.

A DISPLAY operand (GRS) allows an operator to (1) display the status of each system known to the global resource serialization complex, and (2) display the CTCs assigned to global resource serialization and the systems attached to them.

**Global Resource Serialization RAS:** Global resource serialization RAS provides recovery from a system or I/O failure without operator intervention and recovery from a CTC adapter failure using the VARY command.

When global resource serialization detects a CTC or system failure, the automatic reconfiguration facility initiates reconfiguration of the remaining systems and online CTC adapters by issuing an internal VARY GRS (ALL),RESTART command. Global resource serialization permits the first eligible system to attempt the reconfiguration. Once the complex is reconfigured, global resource serialization resumes and processes queued resource requests.

When global resource serialization detects a CTC adapter failure, it issues an internal VARY OFFLINE command to vary the CTC adapter offline. When the CTC adapter is again ready for use, the operator can issue a VARY ONLINE command to bring the CTC back online.

## Scheduler Enhancements

**Message Processing Facility:** The message processing facility (MPF) is an extension of multiple console support (MCS) that allows an installation to suppress the display of nonessential messages on the operator consoles. The installation specifies in SYS1.PARMLIB member MPFLSTxx, all or a portion of the message IDs of messages to be suppressed and can activate MPF using the SET command (SET MPF =).

An installation can activate MPF any time after master scheduler initialization using the SET MPF = command to specify the desired MPFLSTxx SYS1.PARMLIB member, MPF then builds a table that identifies the messages to be suppressed using the IDs contained in the specified MPFLSTxx member. Once MPF is activated, the operator can use the SET MPF = command to select a different MPFLSTxx member or to deactivate MPF. When the operator selects a different MPFLSTxx member, MPF writes a type 90 SMF record indicating the change.

Suppressed messages will be sent to the hardcopy log with an identifier which indicates that the message was suppressed. Action messages (descriptor codes 1, 2, 3 and 11, and JES3 action messages), WTORs, and command responses (descriptor code 5 with the exception of installation-selected responses to MONITOR JOB NAMES, STATUS and TSO) cannot be suppressed. The operator can find out which messages are being suppressed by using the MPF operand on the DISPLAY command.

**Enhanced DISPLAY A and DISPLAY U:** The DISPLAY A (active) and DISPLAY U (unit) commands have been enhanced to provide the operator or system programmer with more complete and explicit system status information. In addition, the format of the DISPLAY A is condensed to save screen space.

**DISPLAY A:** Additional operands and status information for DISPLAY A include the following:

- The operand 'name' is used to display extended status information about a particular job, started task, system address space, or TSO user. Thus, if an operator wants the status of a particular job, it is not necessary to scan the status of all jobs.

- The operand ALL displays extended status information about all jobs, started tasks, system address spaces, and TSO users.
- The following additional information is displayed about jobs, started tasks, system address spaces, and TSO users when the 'name' or ALL operand is specified:
  - ASID - makes the SLIP ASID operand and the DUMP command easier to use.
  - PER active indicator - indicates whether a PER SLIP trap has been set that pertains to this job.
  - Step-must-complete count - helps the operator determine if it is advisable to use the FORCE command.
  - Performance group and domain number - shows the operator the existing performance group and domain values.
  - Processor affinity - provides the operator with the information necessary to determine which jobs must be cancelled (if any) in order to vary a processor offline.
  - Elapsed time and processor time - indicates how long a job has been running and the amount of processor time it has used.
  - Address space status - indicates whether the job is swapped in, swapped out, non-swappable, in long wait, and so on.
  - Type of user - indicates whether the object of the display is a job, mount request, started task, or system address space.

LIST operand output has been condensed to permit more information per line. Additional information provided by the LIST operand includes address space status and type of user.

**DISPLAY U:** An operand (ALLOC) has been added to display the job name and ASID of the job(s), started task(s), or TSO user(s) to which a unit is allocated. Knowing the user(s) of a device helps the operator determine if a device can be varied offline, and helps him decide what action to take. Allocation uses the DISPLAY U enhancements to provide improved recovery of shared DASD allocated to a failing address space.

**Subsystem Definition:** An improved subsystem definition facility allows the user to specify subsystems using a new SYS1.PARMLIB member (IEFSSNxx). Prior to this the user had to modify the subsystem names table (IEFJSSNT) to define additional subsystems that were not defined on the SCHEDULR macro during system generation.

The subsystem definition facility is invoked at 'specify system parameters' time by specifying the SSN= parameter in an IEASYSxx SYS1.PARMLIB member to indicate the desired IEFSSNxx member. IEFSSNxx contains data to be used in identifying subsystems being defined to the system. The function of IEFSSNxx is the same as the subsystem names table (IEFJSSNT), with the exception that

IEFSSNxx can contain (in addition to a subsystem name and the name of an initialization routine) a parameter field to be passed to the subsystem initialization routine.

The primary job entry subsystem must still be specified using the SCHEDULR SYSGEN macro.

## Directed VIO

Directed VIO allows an installation to specify a list of local page data sets that are not to be used for VIO pages unless there is no space available on those data sets that allow VIO. This allows the installation to direct VIO pages away from critical local page data sets (which often reside on faster devices).

A user can invoke this facility by specifying: (1) the NONVIO parameter in an IEASYSxx SYS1.PARMLIB member, (2) NONVIO= at 'specify system parameters' time, or (3) NONVIO= on the PAGEADD command when adding a local page data set. The NONVIO parameter designates one or more local page data sets that are not to be used for VIO paging.

## Subsystem Usability and Reliability Improvements

A number of improvements have been made to the control program to enhance subsystem usability and reliability.

- **Changes to the LOAD service** allow an authorized requestor to:
  - load a module into the common service area (CSA), in either a fixed storage subpool (228) or a pageable storage subpool (241).
  - specify that a module be loaded starting at a specific virtual address. To use this facility, the user must have previously allocated enough storage in his key to contain the module.
  - specify that, in addition to the entry point address that is currently returned to the requestor, the load address of the requested module also be returned.
- **An option for the LINK, LOAD, and XCTL services** limits the scope of the module search to the job pack area queue and one library.
- **SRBTIMER** is a macro that allows an authorized issuer to set an execution time limit for a routine running in SRB mode. If the time limit is exceeded, the routine will be terminated.
- **Changes to the master scheduler** let an authorized issuer of the MGCR macro for the START command supply a token in addition to the existing parameters. The token allows a program issuing an internal START to communicate with the started program. The started program can use the EXTRACT macro to obtain the token.
- **The SETSMF command** (abbreviated SS) allows the user to change individual SMF parameters after SMF initialization.



## Performance Enhancements

The performance improvements provided by MVS/SP Release 3 apply to the areas described below.

### 3033 Extension Feature

Through a combination of hardware and microcode enhancements, the 3033 Extension feature in combination with MVS/SP Release 3 provides MVS installations with significant performance benefits. The use of the 3033 Extension feature reduces the processor execution time required for several high frequency control program functions in the areas of I/O processing, paging, and real storage management. In addition, implementation of cross memory services by the 3033 Extension feature enables system throughput to be maintained while supporting a significant level of system function.

### Paging and Swapping

The paging subsystem has been restructured to increase its efficiency on large processors. This restructure provides the following:

- The 3033 Extension feature used in combination with new software algorithms, dramatically reduces the processor execution time for all paging operations.
- New algorithms which encourage contiguous allocation of related page slots on movable-arm DASD, capitalize on the more efficient data transfer rates of current DASD to provide improved system response. These algorithms particularly benefit the faster data rate of the 3380. A similar approach in the swapping area uses swap data sets for all working set pages. These new paging slot allocation schemes allow the system to use efficient block paging operations to perform paging (including VIO) and swapping, thus reducing paging I/O wait time. TSO response time can be further reduced because swap-in is accomplished in a single stage operation rather than the previous two-stage operation.

Additional response improvement can be achieved through a combination of these swap enhancements and the controls provided by directed VIO. This allows the installation to separate demand paging, VIO, and swapping activity by directing high-priority paging to high- performance paging devices.

### I/O Processing

Performance improvements to I/O processing are achieved as a result of the following enhancements:

- The 3033 Extension feature allows some of the I/O processing formerly done on the processor to be offloaded to the channels. This allows MVS to use the available cycles for productive work in parallel with the I/O processing now done by the channel.
- Code optimization reduces path lengths for some I/O interruption processing.

- A new channel selection algorithm, **BALANCE**, balances the rate of use of each channel on the executing processor by selecting the channel that has the lowest number of active I/O operations on it.

### **Virtual and Real Storage Management**

Path lengths for allocation and control of private virtual storage for many types of data are reduced, causing a reduction in execution time. The use of cross memory services allows the ENQ/DEQ function to relocate data from the system queue area (SQA) virtual storage to a private address space. This restructure reduces the fragmentation of SQA thus decreasing queue search processing and multiprocessing storage allocation (SALLOC) lock usage. It provides performance benefits for large systems (particularly tightly-coupled systems) as well as reducing virtual storage requirements.

Use of the 3033 Extension feature and code optimization have reduced processor execution time for several highly used real storage management functions.

### **Device Allocation**

A restructure of the selection and allocation algorithms for new data sets on direct access devices significantly reduces the execution time for that function. The specific amount of improvement depends on the installation's system generated and online DASD configuration and increases with the system size.

### **Program Manager**

A program manager extension, virtual fetch, tailored for IMS/VS uses cross memory services and provides a potential performance improvement for MVS/IMS installations. This enhancement reduces execution time and channel contention for program fetching during application scheduling.

### **Extended Real Addressing**

Potential throughput improvements may be realized for installations that install the Extended Addressing feature (#3832) and additional real storage. MVS uses the additional real storage to eliminate some paging I/O operations, which allows interactive environments such as TSO to improve response time.

TSO environments improve response time and capacity by using the additional real storage and the logical swapping facility (introduced in MVS/System Extensions). New algorithms allow the real storage manager to effectively use the additional real storage frames to buffer swapping or demand paging, thus minimizing paging I/O operations and wait time.

Extended real addressing requires the MVS/370 Data Facility Product program product (5665-295) or the OS/VS2 Data Facility Device Support program product (5740-AM7)

## **RAS Enhancements**

The RAS enhancements provided by Release 3 of the MVS/System Products are a result of detailed studies of MVS installations. Projections indicate that these RAS facilities may eliminate the cause of a number of the unscheduled IPLs in a 3033 environment.

### **Missing Interruption Handler Enhancements**

Missing interruption handler (MIH) enhancements help to detect additional types of I/O errors and allow the operator to take more timely action to correct the problem. These enhancements consist of the following:

- MIH now detects enqueued I/O requests to inactive ready devices. MIH now notifies the operator of this condition and performs an I/O restart on the device.
- The default interval for follow-up messages that re-inform the operator about missing I/O interruptions and detected enqueued I/O requests is reduced from 6 minutes to 30 seconds.
- MIH uses a new message to follow-up missing interruption messages in cases that require operator action. The follow-up message informs the operator that the condition is a probable device failure.
- MIH now deletes action messages from the operator's console when the condition is corrected.

### **VARY CHANNEL FORCE Enhancements**

Previously, the FORCE option of the VARY CHANNEL OFFLINE command made the channel unavailable for system use even if it removed the last path to an allocated device. Allocated devices without paths remained online and allocated. I/O started to these devices remained enqueued, and the devices could still be allocated to other jobs. The operator had to provide alternate paths to these devices to allow job completion or cancel the job.

The enhanced FORCE option allows the operator to specify that allocated devices are to be taken offline when FORCE removes the last path to these devices. FORCE now purges I/O enqueued to these devices, stops any I/O in process through the channel, and rejects any subsequent I/O requests for the devices. This FORCE enhancement requires a 303x or 308x processor.

### **VARY Device OFFLINE FORCE**

When the missing interrupt handler detects that a device has failed to respond to an I/O request, it issues a message to the operator indicating that the device has failed. If the operator issues a VARY device OFFLINE command, the command processor places the device in a "pending-offline" state; however, the system still allows I/O to be queued to the device. Because the device is still being used, it cannot be deallocated and, therefore, cannot go offline.

However, if the operator issues the VARY device OFFLINE command with the new FORCE option, the command processor places the device in a "pending-

offline” state. It also terminates all I/O queued to the device and causes any subsequent I/O requests to that device to return a permanent I/O error to the requestor. The FORCE option also places the device in a “boxed” state, thus preventing future allocations to the device. Once the device is no longer allocated to any job, the system can set the device offline. After the problem with the device has been corrected, the operator can issue the VARY ONLINE command to resume usage of the device.

## Operator Console Enhancements

This enhancement supports the console operator frame available on the 3036 console (with the console microcode enhancements installed) on 3033 processors. The new frame is available in addition to the existing operator frame. This frame was designed specifically for the MVS operator; it eliminates unused options and adds other options, making the frame less prone to operator error and more usable in system recovery situations. The features of this frame are:

- Restart enhancements that expand restart interruption processing for 3033 processors to include system level diagnosis, repair, and recovery. The operator can choose from two actions to be taken by the restart interruption processor. The operator can
  1. Choose to abend the current job and have the restart handler indicate the name of the job. The operator then can either allow the restart interruption abend (071) to complete or return to the program at the point of interruption.
  2. Let the system diagnose certain system problems and in some cases give the operator the opportunity to correct the problem. With this enhancement the system can:
    - Redrive I/O requests.
    - Scan the MIH message queue and notify the operator of any MIH conditions on paging devices.
    - Terminate any address space waiting for I/O purge to complete.
    - Detect when the WTO buffer limit is reached and give the operator instructions to correct the problem.
    - Detect when the system is idle (no batch jobs or TSO users) and inform the operator.
- A global start/stop function for AP and MP processors.
- A global instruction step function for AP and MP processors.
- An automatic ‘store status’ that the system performs (where appropriate) when the operator requests a stand-alone dump.
- Separate IPL and dump load unit addresses that reduce the possibility of re-IPLing MVS by mistake when intending to take a stand-alone dump.

- A function for tracing loops that creates a trace of several hundred instruction counter values on the console processors diskette. The loop trace can be passed in storage to stand-alone dump or SVC dump, and printed with AMDPRDMP.
- A parameter that allows the operator to specify an alternate nucleus.

### Enhanced Four-Color Support

MVS/SP Version 1 Release 3 has changed the colors used for different message types. When displayed on 3270 Display Stations, these colors improve the users' understanding of these messages and the speed of response. Multiple console support (MCS) uses the four colors supported by all 3279 Color Display Stations for the following types of messages:

Color	Type	Examples
White (intensified)	Immediate action	- WTORs - Descriptor code 2 messages
Red (intensified)	Urgent Notification	- Descriptor codes 1 and 11 messages - IEE159E MESSAGE WAITING
Blue (normal intensity)	Not an urgent Notification	- Console control fields (that is, D, C, K) - IEE163I MODE = RD/R
Green (normal intensity)	Normal Notification	- Job started or ended - Operator input - Echo or operator command - Command responses

### EXCP Limits

This enhancement allows the installation to limit the number of EXCPs that can be outstanding in an address space. The EXCP component maintains an EXCP count for each address space and terminates the job step if the count is exceeded.

### External Damage Threshold

Previously, external damage machine check interruptions did not have a threshold value. This enhancement provides a default threshold value for each of the four types of external damage machine checks and sends a message to the operator if a threshold is exceeded. The operator can use the MODE command to override the default threshold values.

### Dynamic Device Reconfiguration Enhancements

DDR processes tape and DASD swaps independently and only holds allocation resources until the new device is selected. This allows tape repositioning to occur concurrently and can significantly reduce the DDR/allocation interaction as well as improve DDR's usability.

## Alternate CPU Recovery Message

To accomplish alternate CPU recovery (ACR), the failing processor must be in a stopped state. If the malfunction alert handler fails to stop the failing processor, this enhancement will issue a message instructing the operator to manually stop the failing processor so ACR processing can begin.

## Pageable Link Pack Area Protection

Pageable link pack area (PLPA) protection limits segments of storage entirely occupied by PLPA pages to read-only access on 308x processors. If a program attempts to store into a protected segment, PLPA protection will terminate the operation with a program interruption.

## Channel Set Id Message

Message IEA000I indicates an I/O error that is not correctable; this message contains the device address indicating the path which the channel program was using at the time of the error. This enhancement puts the channel set id in message IEA000I to indicate the complete physical path to the device.

## JES3 Enhancements

In addition to the base control program enhancements, MVS/System Product-JES3 Release 3 provides extensions to JES3 Release 3 together with the facilities provided by the JES3 Networking PRPQ (5799-AZT) and the JES3 3800 enhancements. MVS/SP-JES3 Release 3 offers the following facilities:

**Spool enhancements** provide support for the 3375 and 3380 Direct Access Storage devices as JES3 spool devices and additional spool RAS functions. The RAS functions include:

- A spool partitioning facility that allows an installation to subset the spool into smaller pieces called partitions. A partition can be a set of spool data sets or a single spool data set. This facility lets the installation assign job data for a specific job or class of jobs to a particular spool partition. Prior to this, JES3 spread job data across multiple spool data sets, risking the loss of a large number of jobs if a failure occurred on a single spool volume.
- Spool inquiry and modification commands that enhance spool configuration flexibility.
- A drain capability that prevents allocation of spool space on spool volumes when errors occur on those volumes or when maintenance is required.
- A facility that lets the operator remove failed spool volumes or return repaired spool volumes during JES3 restarts.
- Reduced sensitivity to the loss of single track table data.

JES3 usage of common service area (CSA) virtual storage can be substantially reduced by using cross memory services and the optional JES3 auxiliary address space.

On a system basis, users can specify that one or both of two types of JES3 data areas (USAM protected buffers and secondary staging area extents), each of which can occupy significant amounts of CSA, be allocated in the JES3 auxiliary address space. Users can specify that all or a portion of the USAM buffers be allocated in the optional JES3 auxiliary address space. JES3 uses cross memory services to access the data in the auxiliary address space.

**A networking facility** provides the capability to pass jobs and SYSOUT between similar and dissimilar operating systems over binary synchronous telecommunications facilities or channel-to-channel adapters. This facility is compatible with subsystems such as JES2 (MVS/SP-JES2) and VM/SP with the Remote Spooling Communications Subsystem (RSCS) Networking program product (5748-XP1).

**JES3 users can suppress the display of particular non-action** messages using the message processing facility (MPF) available with this release. The messages that may be suppressed include non-action MVS messages (see previous MPF description) and JES3 messages that do not specify ACTION = YES or ACTION = MDS.

In a JES3 complex, JES3 and/or MVS messages can be suppressed either on a complex-wide or originating-processor basis.

The **early volume release facility** allows the user to specify that completed tapes of a multi-volume tape data set are to be made available to other jobs at 'end-of-volume' time. This allows the user to make a portion of a file available to another job before all volumes of the file are completed. This facility requires either the MVS/370 Data Facility Product program product (5665-295) or the OS/VS2 Data Facility Device Support program product (5740-AM7).

Two **control statement user exits** let the installation modify, insert, or delete job control statements or parameters during the JES3 input service function. Exit IATUX33 is invoked when a comment, JCL EXEC, or JES3 control statement (with the exception of the DATASET/ENDDATASET statements) is found and exit IATUX34 is invoked when a JCL DD statement is found (with the exception of DD \* and DD DATA).

**JES3 takes advantage of the 3278/3279 console features.** This includes:

- Support for 24 program function keys (PFKs).
- Support for up to 43 lines on a screen.
- Wide screen support that allows the 3278 Model 5 to display 132-character messages without folding.
- Use of the default colors (blue and green) on the 3279 console.

The following models are supported by JES3.

- 3278 - Models 2, 2A, 3, 4 and 5 (supported by 3274 Model 1D control unit)
- 3279 - Models 2A, 2B, and 3A and 3B (supported by 3274 Model 1D control unit)

## JES2 Enhancements

In addition to the base control program enhancements, MVS/System Product-JES2 Release 3 contains all the functions of JES2 Release 4.1, and the JES2 NJE Release 3 program product (5740-XR8), together with the facilities provided by the JES2 3800 enhancements. A major characteristic of MVS/SP-JES2 Release 3 is that it provides Network Job Entry (NJE) facilities as a standard feature. MVS/SP-JES2 Release 3 offers the following functions and capabilities:

**Spool processing enhancements** increase spool RAS and recovery, ease migration, and provide support for the 3375 and 3380 DASDs and the 3800 Printing Subsystem Model 3 in compatibility mode. These enhancements include:

- Support for the IBM 3375 and 3380 Direct Access Storage devices as spool or checkpoint devices.
- An improvement to the means of defining a track group to use the capacity of existing devices and the IBM 3375 and 3380 Direct Access Storage devices more efficiently in a mixed spool environment.
- Support for the 3800 Printing Subsystem Model 3 in *compatibility mode*. In compatibility mode, JES2 supports this device as if it were a 3800 Printing Subsystem Model 1.

*Note:* This support requires either MVS/370 Data Facility Product Release 1.0 (or a later release) program product (5665-295) or OS/VS2 Data Facility Device Support Release 1.6 program product (5740-AM7).

- A spool offload facility that allows an installation to dump and later restore spool data from a tape, DASD, or MSS virtual volume. The format of the dumped data is both release-independent and spool device-independent. This facility helps mitigate the effect of cold starts when migrating to future MVS/SP-JES2 releases or changing spool devices.
- A bad-track isolation facility that prevents the allocation of track groups with permanent I/O errors.
- The ability to warm start JES2 without all previous spool volumes mounted. Only the primary spool volume must be mounted.

*Note:* Support for the IBM 3375 and 3380 Direct Access Storage devices requires either MVS/370 Data Facility Product (5665-295) or OS/VS2 MVS Data Facility Device Support program product (5740-AM7)

**A generalized installation exit facility** allows installation-written code to be inserted at IBM-defined exit points without having to modify JES2, or at installation-defined exit points. The exit points provided by IBM are located at strategic decision points in JES2 code. The JES2 user exits assist installations in tailoring JES2 to the requirements of their own operating environments. These JES2 user exits are:



- **Exit 1 - Print/Punch Separator:** This exit allows the installation to create its own print and punch separators and to control the production of standard separators.
- **Exit 2 - JOB Statement Scan:** This exit allows the installation to scan and alter the complete JOB statement image and to set corresponding fields in the appropriate JES2 control blocks.
- **Exit 3 - JOB Statement Accounting Field Scan:** This exit allows the installation to scan and alter the JOB statement accounting field and to set corresponding fields in the appropriate control blocks.
- **Exit 4 - JCL and JES2 Control Statement Scan:** This exit allows the installation to scan and alter JCL and JES2 control statements and to process JES2 control statements.
- **Exit 5 - JES2 Command Preprocessor:** This exit allows the installation to preprocess JES2 commands received by the JES2 command processor.
- **Exit 6 - Internal Text Scan:** This exit allows the installation to scan internal text after conversion from individual JCL images and after all of the internal text for a particular job has been created.
- **Exit 7 - JCT Read/Write (JES2):** This exit receives control whenever JCT I/O is performed by the JES2 main task. It allows the installation to read or write installation-defined job-related control blocks to spool.
- **Exit 8 - JCT Read/Write (User):** This exit receives control whenever JCT I/O is performed by a JES2 subtask or by a routine running in the user address space (HASPSSM). It allows the installation to read or write installation-defined job-related control blocks to spool.
- **Exit 9 - Job Output Overflow:** This exit allows the installation to control the disposition of a job when JES2 detects a job output overflow error.
- **Exit 10 - \$WTO Screen:** This exit allows the installation to scan and control a \$WTO message before JES2 queues the message for output.

The following two exits can be used to implement spool partitioning. Spool partitioning allows the installation to limit spool allocation for a job to a subset of spool volumes in a multi-volume environment. Without spool partitioning, JES2 spreads the allocation of spool space for each job equally among spool devices. Therefore, if a failure occurs on a single device, the installation might lose many of the jobs in the system. If a failure occurs on a device when spool partitioning is being used, the installation might lose only the jobs assigned to use that device.

- **Exit 11 - Spool Partitioning Allocation -- \$TRACK:** This exit can be used in conjunction with Exit 12 to implement spool partitioning. It receives control from the JES2 main task before JES2 starts to allocate spool space for a job so that the installation can specify which spool volumes JES2 is to use for the job. The exit also receives control when there are no more track groups available on the spool volumes from which the current job is permitted to allocate space.

- **Exit 12 - Spool Partitioning Allocation -- \$STRACK:** This exit can be used in conjunction with Exit 11 to implement spool partitioning. It receives control from a JES2 subtask or a routine executing in the user address space (HASPSSSM) when there are no more track groups available on the spool volumes from which the current job is permitted to allocate space.

**Output processing enhancements** provide the user with more information about and better control over output. These enhancements include:

- Operator specification of output characteristics for data set groups. This allows the operator to alter the selection priority, format type, FCB, UCS, output class, destination and selection status of output groups using JES2 commands. The operator can also display the status of those characteristics that can now be altered.
- Released held data sets (primarily those held by interactive system users) will be (when possible) gathered and printed with other non-held or released data sets, minimizing the scattering of data sets across printers.
- The specification of logical page size limits (LINECT) for data sets within a job. Previously one logical page size limit was specified at the job level.
- The ability to display the number of lines or cards remaining in a SYSOUT data set, while that SYSOUT data set is being processed.
- A default forms overlay frame name can now be defined for non-impact printers.
- Assignment of multiple alternate route codes to a device so that it can accept output destined for another device.
- The ability to address JOB LOG, JCL images, and system messages using the JES2 /\*OUTPUT control statement.

**Remote job entry (RJE) enhancements** provide more system configuration and operation flexibility. RJE enhancements include:

- Raising the limit of RJE terminals from 255 to 1000.
- The ability to specify data compression on a line basis in addition to the current work station basis.
- Acknowledgement of successful sign-on at remote terminals.

**Network job entry enhancements** improve the ability of JES2 to communicate with other systems. NJE enhancements allow JES2:

- Raising the limit of NJE nodes from 99 to 1000.

- To accept input data regardless of its format or content so long as the data is being passed to another system.

**Warning** NJE JES2 store and forward nodes that attempt to print page mode data (that is, data printable on the 3800 Printing Subsystem Model 3 that is being passed on to a NJE JES2 node that has a 3800 Printing Subsystem Model 3 locally attached) can result in unpredictable results.

- To transmit job statistics to other nodes thus providing the necessary information to print locally produced output at the receiving node.

**JES2 RAS improvements** provide the following:

- Improved command defaults reduce their wide ranging effects if an operator omits an operand by mistake and the default is taken. 'ALL' subparameter must be specified with commands that have the potential to adversely impact the system.
- Event trace enhancements allow tracing of internal JES2 processors which do not have devices associated with them. This assists in diagnosing problems in areas such as the command processor, conversion processor, and line manager processor.
- An error recovery facility similar to the MVS ESTAE/FRR recovery scheme allows internal JES2 processors to handle certain program checks that previously caused JES2 termination. JES2 provides SYS1.LOGREC recording for all JES2 errors regardless of whether recovery is successful.

**Installations can now specify utilization thresholds** for key JES2 resources. JES2 will issue a warning message to the operator when a resource is about to be exhausted. Some of the resources that can be monitored are: console message buffers, JQEs, JOEs, and spool space.

**Enhancements to the \$T command** allow the operator to change the class and priority of a job at any time.

**JES2 command responses now have unique identifiers** instead of \$HASP000. This will expedite operator access to explanatory text in the system messages manual (response texts will remain unaltered). The \$HASP000 identifier will still be used for the affirmative response 'OK'.

**The \$Z command is extended** to enable operators at remote locations to control printers and punches at those locations.

**Installations can specify data sets of unlike attributes to be concatenated** to the initialization parameter library, providing greater flexibility for testing environments.

**Remote terminal access method (RTAM) enhancements** improve serviceability of the HASPRTAM module by splitting it into smaller logically-related modules.

# MVS/System Product Release 3.1

## Base Control Program Enhancements

### Auxiliary Storage Manager (ASM) Enhancements

ASM has been enhanced to support the IBM 3880 Storage Control Model 11. ASM now uses the three paging/swapping exposures for each attached 3350 to schedule multiple concurrent I/O operations.

*Note:* Support for the IBM 3880 Storage Control Model 11 requires either the MVS/370 Data Facility Product program product (5665-295) or the OS/VS2 MVS Data Facility Device Support Release R1.5 program product (5740-AM7).

### Interactive Data Transmission Facility (IDTF)

IDTF is part of TSO extensions (TSO/E) program product (5665-285) and is used to send and receive files among various systems of a multisystem complex. JES2 supports this facility with an exit (Exit 13).

Exit 13 Support for the Interactive Data Transmission Facility of the TSO Extensions (TSO/E) program product (5665-285) allows the transmission of data between specific users at different nodes in a network. JES2 enters an installation exit (Exit 13) each time a file arrives at the receiver's node. Installations can use this exit to screen incoming files and to instruct JES2 to notify the receiver that a file has been received. (JES2 does not notify the receiver unless requested to by this exit routine.)

## JES3

### Performance Improvements

- **Writer Output Multitasking**

Writer output multitasking is a new feature that can be *optionally* invoked to offload a part of the JES3 writer processing from the primary JES3 task to a new task in the JES3 address space. The new task supports writer processing for both local and remote JES3 output writers. This enhancement permits a JES3 global processor to use IBM's tightly-coupled processors more effectively.

### RAS Improvements

- **CTC Recovery Improvements**

New JES3 START command keywords and WTOR options allow the operator to redrive the primary CTC or switch to an alternate CTC at any time.

- **JES3 Hot Start After MEMTERM**

JES3 allows a hot start without a re-IPL after the JES3 address space abnormally terminates (MEMTERM). Prior to this change, the installation was required to re-IPL the processor on which the MEMTERM occurred in order to reactivate JES3.

- **Initialization Recovery**

JES3 initialization recovery provides increased flexibility in initializing JES3, even though there may be certain errors in the initialization parameters, by substituting JES3 defaults for those parameters. Previously, JES3 terminated if such errors were detected in the initialization stream. This change allows an installation to correct the initialization stream errors using an active JES3. JES3 must be restarted to incorporate the corrections.

- **Out-of-Storage Errors**

JES3 recovery processing frees two 8K blocks of storage upon detection of an out-of-storage condition (80A, 878, or 804 ABEND) in the primary JES3 address space. This action increases the probability that recovery routines will complete without also encountering an out-of-storage condition. The operator will be notified of the out-of-storage condition when the next JES3 function is dispatched.

- **DD Statement Limits**

The DD statement limits allow an installation to prevent an out-of-storage condition in the JES3 address space due to control block space required for DD statements. The installation can specify limits for the number of DD statements in a job and/or the total number of DD statements allowed in JES3 converter/interpreter processing at one time. If a job exceeds the DD statement limit, JES3 cancels the job unless the installation overrides this decision in a new JES3 user exit routine.

If a JES3 converter/interpreter (C/I) subtask detects that the installation-defined limit for the total number of DD statements in C/I processing is exceeded, the C/I subtask **WAITs** until the limits are no longer exceeded. C/I subtasks dedicated to TSO LOGONs do not participate in the DD limiting actions.

Operator commands are provided to allow dynamic installation control over both limits.

- **Load Module Control**

All information needed to load JES3 modules into storage and to control the modules once they are loaded is now managed entirely by JES3; MVS no longer manages any of this information. In addition, JES3 now monitors the loaded JES3 modules to control when they are made resident and to delete inactive resident modules. These changes allow JES3 to have better control over the contents of the JES3 address space and reduce the potential for reaching an out-of-storage condition.

- **DDR for Shared Tape**

JES3's capacity to swap tape drives, if a device fails or if requested by the operator, is increased by allowing tape drives to be swapped with other tape drives regardless of the shared or non-shared status of the drives. Also, the eligible tape drives can be devices that are:

- Being used by jobs that have not completed job set up processing
- Fenced for jobs of a different group than the job using the original tape drive

## **Operational Characteristics Enhancements**

- **Networking User Exit Standardization**

The seven nonstandard user exits in JES3 networking are upgraded to make the networking user exits compatible with the rest of the JES3 user exits.

- **SMF Exploitation**

With SMF exploitation, the JES3 installation can selectively record the JES3-related SMF records and selectively invoke the JES3-related SMF user exit routines based on the work category of the associated job. The work categories include started tasks, TSO-related work, and batch work.

- **MSS VUA Checkpoint**

JES3 support for the IBM 3850 Mass Storage System (MSS) is enhanced to include the offline/online status of MSS virtual units in new checkpoint records. This allows the status of MSS virtual units to be preserved over a JES3 hot start.

- **Console Buffer Constraint Relief**

Console buffer constraint relief reduces the number of JES3 terminations that occur when installations have insufficient console buffer space in JES3 private storage to accommodate the volume of console messages the complex is processing.

With this enhancement, JES3:

- Allows users to reserve a portion of console buffer space.

JES3 uses this space only when a shortage of buffer space exists and the CONSOLES FCT modules need extra space.

- Notifies the operator when console space is running low so the operator can free up buffer space before none is left.
- Allows users to reserve a portion of the buffers in any buffer pool they create in a user modification or user exit routine. Users can use the reserved buffers for any purpose they choose.

- **DOS/VSE PNET (Power Networking) Support**

This support allows a JES3 complex to be part of a network that contains a DOS/VSE PNET node. This support:

- Uses newly available data set header fields.
- Removes the restriction on the placement of the 3800 section of the data set header.
- Handles print/punch specifications for incoming data.

- **3800 Printing Subsystem Model 3**

JES3 supports the 3800 Printing Subsystem Model 3 in *compatibility mode*. In compatibility mode, JES3 supports this device as if it were a 3800 Printing Subsystem Model 1; that is, JES3 manages the use of the device.

*Note:* This support requires either MVS/370 Data Facility Product Release 1.0 (or a later release) program product (5665-295) or OS/VS2 Data Facility Device Support Release 1.6 program product (5740-AM7).

### **TSO Extensions (TSO/E) Support**

JES3 supports the Interactive Data Transmission Facility (TRANSMIT and RECEIVE commands) included in the TSO/E program product (5665-285). JES3's interface with TSO allows the transmission and receipt of data between specific users at different nodes in a network. JES3 enters a user exit each time a file arrives at the receiver's node. Installations can use this exit to screen incoming files and to instruct JES3 to notify the receiver that a file has been received. (JES3 does not notify the receiver unless requested to by this exit routine.)

### **JES2**

Release 3.1 of MVS/SP does not contain any JES2 functional updates.

## **MVS/System Product Release 3.2**

### **Base Control Program Enhancements**

#### **MVS/Operator Communication Control Facility (MVS/OCCF)**

MVS/SP Release 3.2 BCP supports the MVS/Operator Communication Control Facility (MVS/OCCF) in the JES2 environment. MVS/OCCF is a program product that allows one or more remote MVS systems to be operated from a host

MVS system. MVS/SP-JES2 provides the following functions in support of MVS/OCCF.

- MVS/OCCF can acquire or alter the use of a console. This support allows MVS/OCCF to obtain and release a console, change the routing codes of a console, or request that messages be broadcast to all subsystems.
- Multiple Console Support (MCS) console specifications can be initialized at IPL using the COMMNDxx member(s) of PARMLIB. After IPL, the master console operator or an operator at an MVS/OCCF console may direct commands to other consoles to correct system problems related to MCS consoles.

### **Scheduler Enhancements**

- A new system parameter, MSTRJCL, allows the installation to specify the module, MSTJCLxx, in SYS1.LINKLIB that contains the JCL to start the master scheduler address space. MSTRJCL may be specified in the default general parameter list, in IEASYSxx members, or entered by the operator.
- The scheduler JCL facility, a structural enhancement to the converter/interpreter, consists of a set of internal interfaces that provide system components with a generalized method for defining and processing new JCL. Internal tables identify the new JCL statements and their parameters to the scheduler JCL facility.

### **Allocation Enhancements**

- Dynamic allocation support for the 3800 printer keywords BURST, CHARS, COPIES group values, FLASH, and MODIFY.
- An ISAM space recovery facility that attempts to locate DASD space on any eligible volume for new, non-specific, single DD, single volume ISAM data sets. This facility was previously available in MVT and SVS.
- Support in the dynamic allocation function (SVC99) for deferred mounting of volumes that are required to satisfy device allocation requests.

### **ISO/ANSI/FIPS Tape Label Support Version 3**

Support for the organization, format, and processing of labels designed according to the specifications of the following industry standards, as understood and interpreted by IBM as of March 1983:

- ISO 1001-1979, level 4
- ANSI X3.27-1978, level 4
- Federal Information Processing Standard 1979

This support requires MVS/370 Data Facility Product program product (5665-295).



### **3279 Display Station Model 2C Support**

Support of the 3279 Color Display Station Model 2C. The 3279 - 2C console for the 4300 is supported by multiple console support (MCS) as an MVS console with full four-color support.

### **JES3**

Release 3.2 of MVS/SP does not contain any JES3 functional updates.

Dormant JES3 code activated by the base control program enhancements supports ISO/ANSI/FIPS tape label support Version 3.

JES3 users require the JES3 ANSI Tape Support feature (5236/5237- FMID JJS2351) and the MVS/370 Data Facility Product program product Release 1.1 (5665-295).

### **JES2**

Release 3.2 of MVS/SP does not contain any JES2 functional updates.

## **MVS/System Product Release 3.3**

### **Base Control Program Enhancements**

#### **3480 Magnetic Tape Subsystem Full Function Support**

- An 8-character display on the tape drive assists operations with volume handling instructions.
- Existing JCL controls the buffered write mode option.
- The MVS assign/unassign facility supports the 3480 Magnetic Tape Subsystem. Currently, installations can configure devices as accessible to more than one system. During operation, an installation can grant or deny access to such devices by means of physical enable/disable switches. Assign/unassign support replaces these switches with operator commands to control the large number of path configuration possibilities available with the 3480 Magnetic Tape Subsystem.

*Note:* Full use of the 3480 Magnetic Tape Subsystem requires the MVS/370 Data Facility Product program product (5665-295); the OS/VS2 Data Facility Device Support program product (5740-AM7) supports the 3480 Magnetic Tape Subsystem only as a compatible tape device.

## 4245 Printing Subsystem Support

The 4245 Printing Subsystem uses a print band rather than a print train or print chain to produce output. The 4245 is a buffered device that can buffer two and six lines of output, respectively. (UCS images for this printer are loaded by the printer itself.)

## JES3

Release 3.3 of MVS/SP does not contain any JES3 functional updates.

## JES2

Release 3.3 of MVS/SP contains the JES2 updates for full support of the 3480 Magnetic Tape Subsystem.

### Increased Amount of JES2 Spool Space

This release increases the amount of spool space that can be defined in a JES2 spool configuration. The amount of increase depends on the size of the JES2 buffer. For example, if the JES2 buffer is defined as 4008 bytes, the maximum number of track groups that can be allocated is increased from 24,832 to 29,856 or approximately 20%.

### Output Processing Enhancements

Output processing is enhanced as follows:

- **Multiple Copies of Output Data Sets**

Users can create many copies of each output data set in a job and each copy can be assigned its own set of output characteristics, such as destination and class. These copies are created using the new OUTPUT JCL statement.

- **Process Mode**

An installation can direct output data sets to a device based on the type of processing required by the data sets (process mode). Each local and remote device can be initialized to accept only output data sets that require specific type(s) of processing. A JCL keyword, **PRMODE**, allows the user to direct output to a device that is set for a particular processing mode.

Users can also request specific processing for a data set that is being transmitted to another JES2 node. This eliminates the need to know which device or SYSOUT class is used at the receiving node to process a specific type of data set.

- **User Control of Output Data Set Groups**

An installation can allow users to define how a job's output data sets are to be grouped into output groups. Users define an output group using the **GROUPID** parameter on the new OUTPUT JCL statement. Data sets are

associated with the group by referencing the OUTPUT statement on the data sets' DD statements. Previously, job data sets were grouped only by JES2.

To be eligible for an output group, the data sets being grouped together must have the same grouping characteristics; that is, all the data sets in the group must have the same group id, output class, destination, external writer and process mode characteristics.

The data sets assigned to the group can all have the same device setup requirements or, if the installation allows, users can group data sets with different device setup requirements, thus creating demand setup groups. JES2 handles these user-defined demand setup groups in the same way as the JES2-defined setup groups. Users can override the device setup requirements defined for each data set in the group by including override values on the OUTPUT JCL statement that defines the group.

Using the new JCL, users can assign output data sets to many different output groups. This facility can be used to send copies of the same data set to several different destinations including local and remote destinations as well as to other locations in a network. It can also be used to send specific combinations of a job's output data sets to different destinations.

The existing operator commands can be used to display and control new user-defined output groups.

- **User-Defined DD Statement Default Values**

By specifying DEFAULT = YES on an OUTPUT JCL statement, users can use the OUTPUT JCL statement to supply default values for a job's SYSOUT DD statement parameters. JES2 uses these values for an output data set when the corresponding parameters are omitted from the data set's SYSOUT DD statement. If the user omits a DD statement parameter and does not define a default value, JES2 uses the installation- or JES2-defined default value.

Default values can apply to all the data sets in a job, or only to the data sets in a specific job step or procedure job step. In addition, the user can assign several different sets of default values to the data sets.

- **User Control of System Output Data Sets**

Previously, if users wanted to change the output characteristics of a job's system data sets, they had to change the characteristics of all the system data sets in the job. (A job's system data sets include the JES2 JOBLOG, JCL images, and the messages data sets.) Users can now use OUTPUT JCL statements to address each of a job's system data sets separately and control them in the same way as they can control the job's SYSOUT data sets.

- **User Control of Output Data Set Priority**

Users can use a JCL parameter to define a data set's output priority, if permitted by the installation. Previously, the priority of output data sets was established internally by JES2.

- **Installation Control of Output Selection**

An installation can choose the criteria it wants JES2 to use when selecting work for each local and remote printer and punch device. The work selection criteria for the device includes output characteristic such as output priority, forms control buffer, and burst specification. By not including a specific output characteristic in the work selection criteria for a device, that characteristic is ignored when JES2 selects work for the device.

To give more flexibility to the selection process, the installation can specify which of the device's work selection criteria must match the work exactly and those that do not have to match. The installation also can specify the order of importance in the selection process of each criterion. The operator can use a command to change a device's work selection criteria or the order of importance of the criteria.

- **Installation Control of Data Set Separation Pages**

An installation can define whether or not a separation page is to be created prior to each output data set routed to a local printer or punch device. Data set separation pages are controlled separately for each local printer or punch in the installation.

The data set separation page is not produced by JES2. When JES2 is ready to print or punch an output data set, it calls exit routine 15 (see 'User Exits' later in this section). It is up to the installation to check the setting for the device and to produce a separation page, if one is required.

- **Output Limit Enhancements**

An installation can request that different actions be taken when a job creates excess print output and when it creates excess punch output. Also, an installation can set limits on the amount of spool space (in bytes) that a job's output is allowed to use.

- **Output Checkpoint Processing Improvements**

The following improvements have been made to output checkpoint processing:

- Output checkpoint processing no longer requires that the JES2 checkpoint data set be available after work is selected from the output queue. JES2 assigns a spool block to each unit of job output when the output is assigned to a device. With this change, the processor controlling the device can write checkpoint data directly to spool without having to acquire ownership of the JES2 checkpoint data set.
- The default value for the CKPTPAGE parameter on the local and remote printer and punch initialization statements is changed. If no value is supplied by the installation, JES2 takes a checkpoint after printing 100 logical pages instead of 1 page. Also, control of the checkpoint values for devices is being extended to the operator.

### ● **Selective Posting for Output Device Processors**

When work is added or returned to the JES2 output queue, only the processors associated with devices that are eligible to select that work are posted. Previously, JES2 posted all waiting output processors.

*Note:* The OUTPUT JCL statement and the JES2 /\*OUTPUT control statement have many parameters in common. No further enhancements will be made to the JES2 /\*OUTPUT control statement.

## **Spool Volume Processing Enhancements**

The following enhancements allow the user additional control over the status and contents of the spool volumes:

### ● **Dynamic Addition and Deletion of Spool Volumes**

The JES2 operator can add or delete a spool volume from the JES2 spool configuration while the system is active. In a multi-access spool environment, all other systems automatically begin operating with the new spool configuration. This facility eliminates the need for a configuration-wide warm start when adding or deleting spool volumes.

More specifically, the operator can add a new or inactive spool volume using the new \$\$ SPOOL command. JES2 starts allocating space on the volume unless requested not to by the operator.

There are two ways that the operator can delete an active spool volume from the configuration:

- The new \$P SPOOL command drains an entire spool volume by stopping allocation of any additional space on the volume and allowing all jobs that have data on the volume to complete processing. This command can also be used to cancel all jobs that have data on a spool volume and are eligible to be cancelled.
- The new \$Z SPOOL command allows currently active jobs that have data on a spool volume to complete processing and then stops all activity on the volume; no further allocation can take place and any jobs with data on the volume can no longer be selected for processing.

An installation can also use the new commands to manage the status and contents of inactive spool volumes. For example:

- The \$\$ SPOOL,P command can be used to add an inactive spool volume and allow processing to complete for all jobs that have data on the volume.
- The \$P SPOOL,CANCEL command can be used to cancel all jobs that have data on an inactive spool volume; the jobs are cancelled without restarting the volume.

After any request that deletes a volume from the spool configuration, the volume can be physically removed from the system as long as the system has

no other dependencies on it. Any changes in the spool configuration are checkpointed so the volumes can retain their status across a warm or hot start.

Using new operands on the display commands, the operator can display the status of a specific spool volume as well as the status of jobs that have data on a specific spool volume. Also, the operator can list the names of all spool volumes that contain data for a specific job.

- **Dumping Specific Spool Volumes**

The operator can now use the spool offload facility to dump a specific spool volume. All jobs with data on the spool volume that meet any other selection criteria specified by the operator (for example, job class or SYSOUT class) will be dumped. If the selected job has data on another spool volume, that data will also be dumped.

## User Modifications Enhancements

This release provides several new ways for installations to modify JES2 processing.

- **Scanning Facility**

The scanning facility is a new facility that installations can use either to parse input and set control block field values based on that input or to translate the contents of control block fields so they can be displayed.

- **User Control Block**

A new control block, called the user communication table (UCT), is available for installation use. JES2 does not build this control block; installations can build their own UCT and include any required data. This control block can be used instead of the user data fields in the HCT.

- **User Exits**

Eleven user exits are added to JES2. The exits are as follows:

- **Exit 0 - Pre-Initialization:** This exit is taken before JES2 processes the initialization options entered by the operator at the console. It allows an installation to change the initialization options, alter JES2 control blocks, and initialize installation-defined control blocks (such as the UCT) before JES2 analyzes the initialization options. The exit can also instruct JES2 to bypass the initialization options or to terminate initialization processing.
- **Exit 14 - Job Queue Work Select:** This exit allows an installation to use its own algorithm to search the job queue for work to be processed.
- **Exit 15 - Output Data Set/Copy Separators:** This exit allows an installation to create separation pages for each data set or copy of a data set. (JES2 only creates separation pages at the start and end of an output

group.) The exit can also be used to instruct JES2 to print an extra copy of the data set.

- **Exit 16 - Notify:** This exit allows an installation to examine and modify the message text of a notify message before JES2 issues a \$WTO to send the message to the operator. This exit can also be used to cancel the message.
- **Exit 17 - BSC RJE Sign-on/Sign-off:** During sign-on processing, this exit allows an installation with a BSC RJE environment to implement security checks in addition to the standard password check and to limit the number and types of remote devices that can be on the system at any one time. The exit can also instruct JES2 to bypass normal sign-on processing. During sign-off processing, the exit allows the installation to gather terminal usage statistics.
- **Exit 18 - SNA RJE Logon/Logoff:** During logon processing, this exit allows an installation with a SNA RJE environment to implement security checks in addition to the standard password check and to limit the number and types of remote devices that can be on the system at any one time. During logoff processing, the exit allows the installation to gather terminal usage statistics.
- **Exit 19 - Initialization Statement:** This exit is taken before each initialization statement is processed. It allows an installation to do the following:
  - additional checking of an initialization statement
  - alter values in the statement
  - add installation-defined initialization statements and parameters
  - process installation-defined initialization statements that were added to the initialization data set (see also “Tailoring the JES2 Initialization Data Set” later in this section)

The exit can also instruct JES2 to bypass a statement or terminate initialization processing.

The installation does not have to include code in this exit routine to process a new or changed initialization statement. As part of the normal processing for an initialization statement, JES2 now uses the scanning facility. The facility uses a scan table to define the contents of each initialization statement. If the installation adds its own scan table to JES2 code for the new or changed statement, JES2 will use the installation-defined table rather than any JES2-defined table when processing the statement.

- **Exit 20 - End of Job Input:** This exit is taken as soon as a job has been read by JES2. It allows an installation to specify or override the job’s system affinity, priority, and execution node requirements. The exit can also instruct JES2 to terminate the job with or without printed output.

- **Exit 21 - SMF Record:** This exit allows an installation to use JES2 control block data to evaluate whether or not an SMF record should be written. The exit is called before the SMF record is passed to SMF modules for processing. (Although the SMF routines contain an exit (IEFU83) that can be used to select or suppress an SMF record, the SMF routines do not have the JES2 control blocks available to them.)
- **Exit 22 - Cancel/Status:** This exit is taken just before JES2 searches the job queue in response to a job status or cancel request. The exit allows an installation to define its own criteria for job selection and job ownership and to return a selected job to JES2.
- **Exit 24 - Post Initialization:** This exit is taken after all the initialization statements have been processed but before initialization processing is complete. It allows an installation to make modifications to JES2 control blocks and to initialize or modify installation-defined control blocks prior to the end of initialization processing. The exit can also be used to instruct JES2 to terminate initialization processing.

- **Tailoring the JES2 Initialization Data Set**

Installations can tailor the initialization data set for their own purposes. They can add their own initialization statements and parameters and replace JES2 initialization statements. The same method discussed above for processing user-defined initialization input added using exit 19 can be used to process input added to the initialization data set.

### **Initialization Options Enhancements**

Using the new **CONSOLE** option, the operator can request JES2 initialization processing to stop before it is complete to allow additional initialization statements to be entered at the console. Previously, the request for JES2 initialization to enter console mode could only be made by including the **CONSOLE** control statement as part of the initialization data set.

### **Secondary Job Entry Subsystem Enhancement**

A secondary job entry subsystem can communicate directly with a started task. As a result, installations can run started tasks under a secondary JES. Previously, started tasks could only be run under the primary JES.

### **Standardized Use of SMF**

In addition to using values defined during JES2 initialization for each job class, JES2 now uses the parameters in the **SMFPRMxx** member of **SYS1.PARMLIB** to determine if SMF records should be recorded and if the JES2-related SMF user exits **IEFUSO** and **IEFUJP** should be invoked. The records are written and the routines are invoked on the basis of the work category of the associated job. The work categories include started tasks, TSO users, and batch jobs. (Previously, batch jobs were not included.) This is consistent with the method currently used by the base control program.



### **Improved Handling of Remote Messages**

Messages sent to a remote work station are now routed to the work station's console rather than to a printer in both a single system JES2 complex and a multi-access spool configuration.

### **Increased Default Region Size**

The default region size assigned by JES2 for each step of a batch job is changed from 128k bytes to 256k bytes of storage.

### **3800 Printing Subsystem Model 3 Support**

JES2 supports the 3800 Printing Subsystem Model 3 in compatibility mode. In compatibility mode, JES2 supports this device as if it were a 3800 Printing Subsystem Model 1; that is, JES2 manages the use of the device.

*Note:* This compatibility mode support requires either MVS/370 Data Facility Product Release 1.0 (or later releases) program product (5665-295) or OS/VS2 Data Facility Device Support Release 1.6 program product (5740-AM7).

## **MVS/System Product Release 3.4**

### **Base Control Program**

Release 3.4 of MVS/SP does not contain any base control program functional updates.

### **JES3**

#### **Spool Constraint Relief**

Spool constraint relief increases the capacity of the JES3 spool and allows installations greater control over the use of spool space and over spool space allocation. These enhancements include:

- The number of spool volumes that can be used in a JES3 complex is increased. JES3 can now support up to 1024 spool volumes in one complex.
- The number of spool space allocation units (track groups) in a JES3 complex has been expanded. The number of track groups that JES3 can allocate for work is now limited only by the size and number of spool data sets used in the complex.
- The number of track groups supported in one JES3 spool data set is increased. Each spool data set can contain up to 4 billion track groups.

- The size of a track group is no longer limited to a half or a full cylinder. Installations can define a track group in terms of a number of spool records. JES3 converts this number into the number of records that can be contained in some number of full tracks on each type of volume containing a spool data set. As a result, JES3 now allocates a number of **tracks** of spool space to a job or data set rather than a half or full cylinder.
- Installations have better control over the amount of spool space allocated for each allocation request. Installations can define allocation quantities to be used for jobs in a specific job class and for data sets in a specific SYSOUT class; this is in addition to defining an allocation quantity for jobs executing on a specific processor. Also, the `/**MAIN` control statement can be used to request allocation quantities to be used for a specific job that override the allocation quantities JES3 would otherwise apply to the job.

The system programmer and users can also specify two quantities for each type of allocation request. The first is the number of track groups to be allocated initially for a job or data set and the second is the number of track groups to be allocated for each allocation request after the initial quantity of space is exhausted.

In addition to allowing better control of spool space, these changes can reduce the number of interactions between the local and global processors.

- Installations can now monitor the amount of spool space used by jobs. SMF record type 26 (JES3 job purge record) contains the number of spool records actually used by a job. This information can help when defining the size of spool space allocation units (track groups) and the amount of space to be allocated for the different types of allocation requests.

## Spool Partitioning Enhancements

Spool partitioning enhancements allow an installation to control the way space is used in each spool partition and to limit the types of data that JES3 is to place in each spool partition. These enhancements include:

- Installations can vary the size of the spool space allocation unit (track group) based on spool partitions. In this way, installations can assign jobs or data sets with very small or very large spool space requirements to a spool partition that has a correspondingly small or large spool space allocation unit assigned to it.

This change can reduce the amount of I/O required for the jobs or data sets and can save space on the spool data sets.

- Spool partition overflow can be controlled, allowing installations to restrict the contents of spool partitions to only data from specific processors, job classes, and SYSOUT classes. For instance, one partition or a series of partitions can be defined as overflow partitions for a specific type of data. As a result, JES3 will place that type of data only in the assigned partition and its overflow partitions. In addition, a partition can be defined so that overflow is **not** allowed to other partitions (including the default partition). New commands allow the installation to change the overflow specification for any partition.

- Spool data set limit processing is changed so that installations can detect when the amount of data placed in each spool partition exceeds a value set by the installation. This allows an installation to make needed adjustments when a single partition is running out of space. Previously, limits were applied to the entire spool configuration.

Also, a spool data set limit is now expressed in terms of a percentage of the track groups in a partition rather than an absolute number of cylinders in the spool.

### **Operational Controls Enhancements for Spool**

Operational controls for spool have been enhanced as follows:

- Spool volumes can be deleted from the spool configuration; a cold start is no longer required to do this.
- Inquiry commands have been added to help monitor the use of spool space and the use of processors. Commands are available to do the following:
  - List the largest users of spool space
  - List the spool data sets that are assigned to a specific spool partition
  - List the processors that can be used to process a specific job
- Installations can control the contents of the output service hold queue using the new spool maintenance facility. Operators can use a command to delete data sets from the hold queue according to the criteria entered in the command. The criteria are the output class, the number of days the data sets have been on the queue, and the userid of the TSO user who created the data set. A new user exit allows the installation to check each data set selected for deletion and to reverse the decision, if necessary, or to provide alternate processing.

### **RAS Improvements**

RAS improvements include the following:

- Checkpoint data set handling is changed as follows:
  - Installations can define a second, or duplexed, checkpoint data set for the complex. This can help ensure that a valid copy of the checkpoint data set is always available.
  - Either the primary or the secondary checkpoint data set can be replaced during a hot or warm start.
- The handling of defective spool tracks is changed. JES3 now records the location of defective spool tracks as they are encountered and retains this information across a hot start. For a warm start, the system programmer can use a new command before the warm start to list all the defective tracks and use this information to update the initialization stream.

## Converter/Interpreter Functional Subsystem

To help relieve virtual storage constraints in the JES3 global address space, installations can optionally move a portion of JES3 conversion/interpretation (C/I) processing to one or more new address spaces. These address spaces are called functional subsystem (FSS) address spaces and can be located on the global processor, on one or more local processors, or on any combination of the global and local processors. JES3 uses the new functional subsystem interface (FSI) to communicate between C/I processing in the global address space and C/I processing in these new functional subsystem address spaces. All C/I processing is coordinated from the JES3 global address space.

To use this option, installations specify each C/I functional subsystem address space that is to exist, on which processor the address space will be active, and the number and types of jobs to be handled in each address space. New commands allow the operator to display and change these definitions.

When the functional subsystem (FSS) address spaces are defined, the job flow through C/I processing is changed for jobs chosen to be processed in a FSS address space. The job passes through conversion, interpretation, and prescan processing in the FSS address space and through postscan and locate processing in the global address space. Jobs that were rescheduled also pass through the postscan process on the global processor. Installations can control the number of copies of the POSTSCAN DSP in the same way that they control the number of CI DSPs.

Installations can use the new user exit, IATUX46, to control which mains are eligible to process the job and the user exit, IATUX49, to control which address space is used to process the job. To help track jobs, displays of information on job status contain new status codes for jobs in C/I processing. The codes indicate at what stage within C/I processing the job is in.

## JCL Statement Limit Processing

JCL statement limit processing is extended so that installations can define limits in terms of a total number of JCL statements rather than a number of DD statements. This allows greater control over JES3 global and JES3 C/I FSS private storage. The new limits are as follows:

- Job JCL statement limit - the maximum number of JCL statements allowed in a job. This limit applies to all jobs, regardless of which address space the job is routed to for C/I processing.
- Address space JCL statement limit - the maximum number of JCL statements that can be processed concurrently in an address space that supports C/I processing. (The maximum number that can be defined is 100 million - 1.)

The operator commands that controlled DD limit values are replaced by keyword changes and new commands that control the JCL limit values.

## Procedure Library Processing Enhancements

Enhancements to procedure library processing allow users to update one or more data sets in a procedure library that contains concatenated data sets. Previously, users could only update procedure libraries that consisted of one data set. In addition, JES3 will keep the operator aware of the status of procedure libraries through new inquiry operator commands.

## Internal Reader Job Defaults

Installations can now define a separate set of defaults for jobs submitted through the internal reader. The defaults are:

- The procedure library to be used with the jobs (PROCLIB default of 'ST')
- The set of C/I options to be used for the jobs (C/I parameter identifier default of '01')

Previously, defaults could be assigned only for started tasks, TSO jobs, and batch jobs as specified on an \*X CR command.

## Control Over Job Output

Control over job output is increased as follows:

- Installations can set limits on the amount of spool space (in bytes or in pages for page mode data sets) that a job's output is allowed to use. If the output exceeds this limit, JES3 sends a warning message to the operator and takes whatever action is defined by the installation. Users can override this limit using a new parameter on the `//*MAIN` control statement.
- The new `OUTPUT JCL` statement and `OUTPUT` parameter of the `SYSOUT DD` statement give users additional methods of specifying the default and overriding characteristics used for processing an output data set. The functions provided by the new `JCL` statement are the same as the functions provided by the `JES3 FORMAT` control statement with the following additions:
  - Users can assign multiple default values to an output characteristic.
  - Users can provide step-level default values for the processing of an output data set that override job-level default values.
  - A new user exit `IATUX44` allows an installation to modify `OUTPUT JCL` statements.

## \*VARY Command

The JES3 \*VARY command can be used to vary devices online or offline to both JES3 and MVS; the operator does not have to issue an MVS VARY command for the device. A device can also be varied online or offline to MVS during JES3 initialization; in most cases, the XUNIT parameter on the DEVICE initialization statement controls this.

## Console Support

JES3 console support is enhanced as follows:

- The IBM 3279 Model 2C is supported as a JES3 console. This console displays information in various colors depending on the type and relative importance of the information being displayed. JES3 now provides compatible multiple console support (MCS) using four-color and line intensification consoles and line intensification console support.
- When an IBM 3277 or 3278 is used as a JES3 console, important messages are intensified in the display.
- The IBM 3290 is supported as a 3278 or 3279 system console.

## 3480 Magnetic Tape Subsystem

JES3 supports the 3480 Magnetic Tape Subsystem as a JES3-managed device and also supports the MVS assign/unassign facility for the tape drive. This facility allows the operator to use the JES3 \*VARY command to vary the device online or offline to each processor in a JES3 complex without having to physically set enable/disable switches before entering the command.

The MVS assign/unassign facility can be used to reserve the 3480 for one or more processors. For JES3-managed 3480s, the JES3 VARY command or JES3 initialization can invoke assign/unassign processing; for non-JES3-managed 3480s, MVS VARY and initialization invokes assign/unassign.

*Note:* 3480 Magnetic Tape Subsystem support requires either the MVS/370 Data Facility Product program product (5665-295) or the OS/VS2 Data Facility Device Support program product (5740-AM7).

## 3800 Printing Subsystem Model 3

JES3 supports the 3800 Printing Subsystem Model 3 in *full-function mode*. In full-function mode, JES3 uses an output writer functional subsystem (FSS) to provide the functions traditionally provided in the JES3 global address space (specifically, device-dependent functions that support the 3800 Printing Subsystem Model 3). The output writer FSS relies on JES3 for its system image. That is,

- Functional subsystem initialization is specified as part of JES3 initialization.
- Operator communication concerning this device is managed by JES3.
- JES3 resources, such as devices and the spool, although used by the FSS, are still controlled and managed by JES3.
- JES3 controls output scheduling.
- JES3 and the FSS termination/restart are coordinated by JES3.

- A new user exit, IATUX45, allows an installation to change information that is to be written on the job header, job trailer, and data set header page for data sets processed by output writer functional subsystems.

Unlike a C/I FSS, an output writer FSS contains a functional subsystem application (FSA) that performs the device-dependent functions required to drive the 3800 Model 3. The FSA consists of the Print Service Facilities program product (5665-295). Using this approach, the overhead that JES3 incurs for other devices to format the output and perform I/O to the printer is done by the FSA. The FSI is used to communicate between the output writer in the JES3 global address space and the FSA in the FSS address space.

The Print Services Facility program product and MVS/370 Data Facility Product program product (5665-295) are required to operate the printer in full-function mode.

#### **4245 and 4248 Printing Subsystems**

JES3 supports the 4245 and 4248 impact printers as local printers, similar to its support of the 3211 printers with additional buffer synchronization to handle errors.

#### **MVS/Bulk Data Transfer Facility (MVS/BDT)**

JES3 supports the MVS/BDT Release 1 Program Product (5665-302)

#### **Utility to Check Initialization Errors**

Installations can use a new utility to check a JES3 initialization stream for errors before using the stream to initialize JES3. The utility is a job that runs in a user's address space and simulates JES3 initialization processing. User exit IATUX15 (initialization statement scan) can be used with the utility in the same way as it is used during warm or cold start processing. The utility scans the entire initialization stream for syntax errors and can detect logic errors in the DEVICE, SETNAME, RJPLINE, and HWSNAME statements. Any incorrect statements can be corrected before being used to initialize JES3.

#### **Conversion Facility**

Installations can use an enhanced dump job facility to help convert from JES3 Release 3.1 to JES3 Release 3.4 and from JES3 Release 3.4 to JES3 Release 3.1. During the conversion process, the dump job facility under Release 3.1 can be used to save jobs that are currently in the JES3 queues. All control block data dumped by the Release 3.1 dump job facility is translated to the Release 3.4 level. After performing the cold start that is required to initialize JES3 Release 3.4, the dump job facility for Release 3.4 can then be used to restore the jobs to the JES3 queues.

## JES2

### 3800 Printing Subsystem Model 3 Support

JES2 supports the 3800 Printing Subsystem Model 3 in *full-function mode*. In full-function mode, JES2 uses a functional subsystem to provide the functions traditionally provided by JES2 (specifically, device dependent functions related to the 3800 Printing Subsystem Model 3). The functional subsystem relies on JES2 for its system image. That is:

- During JES2 initialization, the functional subsystem is initialized.
- JES2 manages operator communication.
- JES2 still controls and manages JES2 resources, such as devices and the spool, although these resources can be used by the functional subsystem
- JES2 controls output scheduling.
- JES2 coordinates the termination/restart of the functional subsystem.

Print Services Facility program product (5665-275) is the name given to the programs that make up the functional subsystem that drives the 3800 Printing Subsystem Model 3. The Print Services Facility and the MVS/370 Data Facility Product program product (5665-295) are required to operate the printer in full-function mode.

A JES2 functional subsystem (FSS) is an extension of JES2 processing that takes place in an individual address space separate from the JES2 address space. Specific functional processing (for example, device processing) that JES2 would normally perform within its own address space forms the basis for the functional subsystem; the functional subsystem address space isolates this processing from JES2. JES2 communicates with the functional subsystem (that is, the programs in the functional subsystem address space) to perform the specific functional processing. JES2 is thus insulated from the specifics related to the processing associated with the functional subsystem (for example, the channel programs that drive a particular printer).

### User Modification Enhancements

Two new installation exits are provided in JES2:

- **Exit 23 - FSS Job Separator Page Area (JSPA) Processing:** This exit allows an installation to modify separator page information for data sets that JES2 assigns to a functional subsystem application (FSA). When JES2 assigns the first data set of an output group to the FSA, a job separator page data area (JSPA) is created and passed to the FSA. The FSA uses the information in the JSPA to generate job header, job trailer, and data set header pages (if required) for the data set. Exit 23 allows an installation to modify or expand the information passed to the FSA.



- **Exit 25 - JCT Read/Write (FSS):** This exit is taken whenever JES2 code, residing in the functional subsystem address space (HASPFSM) performs JCT I/O. An installation uses this exit to perform I/O for any of its installation-specific control blocks that have been created as part of the functional subsystem. Exit 25 is similar to exits 7 and 8.

### **Relief of Virtual Storage Constraints**

Virtual storage is allocated for JES2 processor control elements (PCEs) in a different way. Remote printer, punch, and reader PCE storage is no longer allocated during JES2 initialization. This allocation minimizes the storage overlap that occurs when both temporary DCT storage and permanent DCT storage for remotes are allocated at the same time. Virtual storage for remote device PCEs is allocated only when the remote is signed on (BSC SIGNON or SNA LOGON) or automatically started (for the BSC dedicated line or SNA AUTOLOGON). Remote PCE storage is unallocated when the remote signs off or when the dedicated lines are drained.

Also, specific remotes may now be left undefined on one or more members of a JES2 multi-access spool (MAS) complex. A remote is defined by the specification of a RMTnnnn initialization statement during initialization. The &NUMRJE parameter continues to define the total number of remotes in the MAS complex. The definition of a remote causes virtual storage to be allocated for device control tables (DCTs) associated with each of the remote's devices; if a remote is left undefined, no DCT storage is allocated. Thus, a remote may be left as undefined on a JES2 system without incurring a storage penalty.

The amount of virtual storage savings depends on the number of remote devices defined and whether or not they are signed on. For example, an installation with 1000 remote work stations, with each having one printer and one reader, can save up to 900K bytes of virtual storage or more when only 300 remote work stations are logged on at any one time.

*Note:* If remote work stations logon and logoff periodically, Some of the virtual storage savings might be nullified.

### **4245 and 4248 Printing Subsystems**

The 4245 and 4248 Printing Subsystems are supported as JES2-managed devices.

# MVS/System Product Release 3.5

Release 3.5 of MVS/SP provides the following enhancements:

## Base Control Program

The BCP component of MVS/SP 1.3.5 contains the following:

- Support for the IBM 3090 model 200 processor in System/370 mode
- Support for frame deallocation to enhance reliability, availability, and serviceability (RAS)
- Stand-alone dump enhancements
- Global resource serialization enhancements

## IBM 3090 Model 200 Processor Support

MVS/SP 1.3.5 is enhanced to support the IBM 3090 model 200 processor in System/370 mode.

## Frame Deallocation Support

Frame Deallocation is a combination of hardware and software functions that allow a task to continue processing when certain types of double-bit main storage errors occur on the IBM 3090 model 200 processor. When an error of this type occurs, hardware functions temporarily correct the error. Software functions move the contents of the storage frame containing the error to another frame and mark the frame with the error offline. This restores normal system operations on the IBM 3090 model 200 processor.

For Frame Deallocation to function, a frame must be available and the frame causing the error must contain pageable data, not a fixed page. Frames containing fixed pages that cannot be deallocated dynamically are taken offline when the pages become free.

## Stand-Alone Dump Enhancements

Stand-alone dump supports the 3480 Magnetic Tape Subsystem in full-function mode as an initial program load (IPL) or output tape device. Stand-alone dump is restructured to permit future maintenance. In addition, an installation can specify a list of consoles to stand-alone dump; only listed devices can appear as consoles to stand-alone dump. This satisfies SHARE requirement SBMVSE81002.

## Global Resource Serialization Enhancements

Changes in global resource serialization simplify maintaining the resource name lists (RNL): an installation can place RNLs in SYS1.PARMLIB or SYS1.LINKLIB. Installations can IPL their systems using IBM-supplied default RNLs.

## Functions Included from MVS/System Extensions

This section describes the MVS/System Extensions functions which are included in all releases of the MVS/System product.

### Action Message Retention Facility

Action message retention is a system facility which retains all action messages (descriptor codes 1, 2, 3 and 11) even if they have rolled off the screen. When active, the facility retains action messages until either the action is performed or the operator deletes the message. The operator can use the DISPLAY R command to retrieve retained messages.

### SRM Enhancements

The SRM enhancements permit better control over dispatching priorities from the installation performance specification (IPS), allow an installation to regulate a multi-subsystem environment, improve control over assigning performance groups, and allow more detailed reporting of subsystem transactions.

- Priority Queueing

The priority queueing option controls I/O requests against logical channels; it allows the installation to improve the response time of specific users or critical applications. If priority queueing is invoked, the I/O Supervisor queues all deferred I/O requests according to either the I/O priority specified for the user in the IPS or the dispatching priority associated with the issuing address space. The only exception is paging I/O (swapping, paging, VIO paging), which is assigned the highest I/O priority.

- Improved Control of a Service Distribution to Domains

Enhanced domain control adjusts MPL (multiprogramming level) targets based on the service rate for each domain defined in the IPS resulting in improved control of the service distribution to domains. The installation can control total domain service rate or, control average service rate to ready users in the domain.

- Extended Control of Dispatching Priorities

The improvements to dispatching priority control are:

- An installation can expand the APG range to include all the dispatching priorities. This allows the installation precise control over the rules gov-

erning the dispatching of work in swappable and non-swappable address spaces.

- An installation can place high-priority batch jobs and low-priority batch jobs in different mean-time-to-wait groups in the APG. This allows high-priority processor-bound jobs precedence over all low-priority batch jobs.
- An installation can define the desired interval at which SRM rotates address spaces within a particular rotate priority.
- The number of fixed priorities under SRM's control is increased because the expanded APG range can contain fixed priorities in each set of 16 priorities.
- A time-slice dispatching function distributes system resources among multiple subsystems. This function gives an installation more control over multiple non-swappable subsystems by reducing each subsystem's ability to monopolize the system.
- The installation can specify the dispatching priorities in the IPS as relative numbers rather than absolute values.

- Improved Installation Management

A SYS1.PARMLIB member called the installation control specification permits enforcement of performance group assignments to individual transactions based on user identification, transaction name (such as job name), or class.

- Subsystem Transaction Reporting

Transaction data for interactive subsystems can be reported by RMF through the online session, background reports, or post-processing summaries. This reporting permits direct feedback on an installation's performance objectives and eliminates the need for multiple report processors. Transaction reporting is available for TSO commands when the TSO Command Package (5740-XT6) is installed.

- Simplified Modification of Constants

Many of the constants that the SRM uses in its control algorithms have been placed in the IEAOPTxx PARMLIB member. An installation can use the SET command with the OPT keyword to change the constants in effect. This allows alteration of algorithms without requiring modification of base system control program code.

- Storage Isolation

The storage isolation function protects selected groups of users from having frames stolen during real storage shortages. These users are therefore less affected by fluctuations in real storage availability. Storage isolation can also be used to place an upper limit on the number of frames held by a user.

- **Storage Load Balancing**

The storage load balancing function minimizes the periods of real storage contention. This function detects real storage imbalances, either shortages or excessive availability, and favors heavy users of real storage for swap-out or swap-in accordingly.

- **TSO Control**

Using a response time parameter in the first period of a TSO performance group, installation management can specify the desired response time for TSO transactions. By limiting response time when the system is under-used and reserving excess capacity for future applications, end users are less affected by fluctuations in the system's workload.

- **Logical Swapping**

Logical swapping, also referred to as demand swapping, allows SRM to better use real storage to reduce system overhead in a TSO environment. When SRM detects the availability of a sufficient amount of real storage, TSO address spaces going into terminal-wait condition are physically swapped out only when necessary.

- **SRB Service Definition**

AN installation can optionally add SRB service as a service definition coefficient in the IPS. As a result the accuracy of control over address spaces that use significant amounts of SRB time is increased.

- **Additional Data for SMF Records**

MVS places additional data in SMF records 4, 5, 34, and 35. These records report individual components of service (I/O service, main storage service, SRB service, and CPU (TCB) service) that are added together to obtain the total service units used by an address space.

## **I/O Improvements**

- **Channel Selection Algorithms**

An installation can improve performance and balance channel use by choosing one of the following channel selection algorithms:

- The primary channel is always tried first. This is the default.
- The channel last used for a specific device is the first one tested on a subsequent request for the same device.
- The sequence of processing the primary and secondary channels is rotated.
- The secondary channel is always tried first.

- Logical Channel Selection

This facility allows two or more jobs using the same physical channel to obtain equal use of the channel over a given period of time. Each logical channel receives equal use of physical channels, which reduces a single job's ability to monopolize a channel.

## SMF Enhancements

The SMF enhancements improve SMF function and performance without impacting current operating procedures and data reduction routines.

- Performance Improvements

An improved SMF writer greatly reduces SMF overhead by using branch entry MVS services, a variable number of buffers, VSAM data sets, and by serializing with a lock rather than with ENQ. In addition, an expanded SMFWTM macro (SMFEWTM) supports an interface to branch enter the SMF writer routine.

- Flexibility Enhancements

Several options can be specified on either a system-wide or a subsystem basis. The options include record selectivity by record type, exit selectivity by exit name, and an interval recording option based on a real-time specification. Other flexibility enhancements include:

- A SET SMF command allows dynamic modification of SMF options in effect.
- A macro (SMFRTEST) allows programs to determine if a particular record type is requested before constructing the record.
- Up to 36 VSAM data sets can be made available for SMF recording.
- An SMF option of the DISPLAY command, used to display the SMF data set status and the current SMF options.

- Data Integrity Improvements

Data integrity improvements allow the installation to:

- Periodically checkpoint certain SMF accounting data collected for long-running jobs.
- Specify the maximum time that data can remain in the in-storage buffers before it is written to the recording data set.
- Pre-format the SMF data set.

- **Completeness**

SMF now collects data for all address spaces in the system, including problem programs started from the operator's console and system tasks. A type 23 record is generated at the expiration of the "STATUS" time interval to record SMF statistics.

A type 90 record, created for operator tracking includes:

- The options in effect after a SET command has been issued.
- The domain parameters changed by a SETDMN command.
- The recording data set in effect after a SWITCH SMF command has been processed.
- The time of day that a HALT EOD command was issued.
- Reliability data including the time of system failure, reason for system failure, and operator name.

A type 30 record provides a common record format and common data for all work termination and interval recording of address spaces. This record contains all the data available in the record types 4, 5, 20, 34, 35, and 40.

With the TSO Command Package program product (5740-XT6) also installed, the type 32 record is provided for TSO users. This record contains a count of each of the unique commands entered since the beginning of the session or since the last checkpoint interval record.

The end user can no longer bypass processor time accumulation by using the TIME = 1440 parameter. However, TIME = 1440 still allows the user to bypass job cancellation for exceeding the installation-defined processor usage or wait time limits.

- **Usability Enhancements**

The SMF dump utility IFASMFDP can now dump the VSAM SMF data sets to one or more variable-blocked sequential data sets on either tape or DASD, read a dumped data set and produce a report on record activity, and/or route the records into one or more retention files.

- **Accounting Direction Provided**

A record for subsystem "functional accounting" command usage data is provided. With the TSO Command Package program product (5740-XT6) also installed, the type 32 record provides accounting data for TSO users based on the types of commands issued during the user's session.

Resource accounting is enhanced by the type 30 record which provides accounting data (resources used) for batch jobs, started address spaces, and TSO users.

- The type 6 record is enhanced to support the 3800 Printing Subsystem Model 3; In this record, statistics concerning pages printed are maintained.

## **Additional and Improved functions**

Two additional options are provided for the SCHEDULE macro instruction. A local lock option allows SRBs to receive control with the local lock held and an FRR option allows SRBs to receive control with an FRR already established.

The STATUS function has an additional option for use by routines that modify SRB dispatchability when the tasks in an address space are known to be non-dispatchable. This eliminates having to perform a TCB scan to modify SRB dispatchability.

A usability option allows an installation to specify an alternate nucleus in response to the 'IEA101A SPECIFY SYSTEM PARAMETERS' message.

## **Improved System RAS**

Improved system RAS is provided as follows:

- Additional storage protection protects critical low-address storage from inadvertent destruction by key zero programs.
- Dynamic address translation hardware is made more efficient by reducing the duplicate entries in the TLB (translation-lookaside buffer) and improving the efficiency of programming signals that indicate certain TLB entries must be purged.

*Note:* The 4341 Processor does not support the above RAS improvements.



## Chapter 3. Planning Information

### Machine Requirements

The MVS/System Product requires the 3031, 3032, or 3033 processor (which contain the System/370 Extended Facility) or the System/370 Models 158 and 168 with the System/370 Extended Feature (feature number 7730 or 7731 on the Model 158, feature number 7730 on the Model 168). To run on the 4341 Processors, the MVS/SP requires the Extended Control Program Support facility for MVS (ECPS: MVS). Release 3 of the MVS/System Product supports the optional 3033 Extension feature on 3033 UP, MP, and AP processors (including model groups N and S) and the microcode engineering change on 3031 UP and AP processors.

The MVS/System Product supports the following processors:

Model 158-1	UP/MP/AP
Model 158-3	UP/MP/AP
Model 168-1 with RPQ S20579	UP/MP
Model 168-1 with RPQ S20580	AP
Model 168-3	UP/MP/AP
4341 Processor Model Group 1	UP
4341 Processor Model Group 2	UP
4361 Processor Model Group 5	UP
4381 Processor Model Group 1	UP
4381 Processor Model Group 2	UP
3031 Processor	UP/AP
3032 Processor	UP
3033 Processor	UP/MP/AP
3081 Processor Complex*	Dyadic
3083 Processor Complex*	UP
9081 Processor Complex*	Dyadic
9083 Processor Complex*	UP
3084 Processor Complex* +	MP
3090 Processor Complex Model 200**	Dyadic

\* MVS/SP Release 1 with the Release 1 enhancement and subsequent releases support the 308x and 908x processor complexes in System/370 mode.

\*\* This processor must be in System/370 mode.

+ This processor must be partitioned for use with the MVS/System Product.

# Programming Requirements

The MVS/System Product requires Release 3.8 of OS/VS2 MVS with OS/VS2 MVS Processor Support 2 installed.

In order to use the following functions and devices, MVS/System Product requires either the MVS/370 Data Facility Product program product (5665-295) or the OS/VS2 Data Facility Device Support program product (5740-AM7):

- JES3 early volume release (MVS/SP-JES3 Release 3) \*
- Checkpoint/Restart facilities (MVS/SP Release 3) \*
- 3375 Direct Access Storage \*\*
- 3380 Direct Access Storage
- Indexed VTOC
- DADSM management exits
- Extended Real Addressing (MVS/SP Release 3) \*\*\*
- 3880 Speed Matching Buffer for 3380 feature \*
- Performance Enhancements \*\*\*
- 3880 Model 11 Paging Subsystem \*\*\*\*
- 3480 Magnetic Tape Subsystem + +
- 4245 and 4248 Printing Subsystem +
- 3800 Printing Subsystem Model 3 +

\* Requires the Data Facility Device Support (DFDS) Release 1 enhancement.

\*\* Requires a PTF to the DFDS Release 1 enhancement.

\*\*\* Require support provided in the most current level of DFDS.

\*\*\*\* Requires DFDS Release 1 Modification Level 5.

+ Requires DFP/370 Release 1.1 program product (5665-295)

+ + Requires DFP/370 Release 1.1 (program number 566-295) for full function operation or DFDS Release 1.7 (5740-AM7) for compatible operation.

Installations that use IPCS and MVS/SP Release 3 or Release 3.1 require modifications to IPCS. These modifications allow IPCS to run with changes made both for MVS/SP Release 3 and Release 3.1 control block structures. For convenience, the IPCS modifications are distributed on the MVS/SP Release 3, 3.1, 3.3, and 3.4 tapes.

Installations that use JES3 Release 3 (SU26) and Extended Real Addressing (supported in MVS/SP Release 3) require a modification to JES3 Release 3. This modification allows JES3 Release 3 to run with Extended Real Addressing. For convenience, this modification is distributed on the MVS/SP-JES3 Release 3 tape. A similar modification is required for the JES3 Component in MVS/SP-JES3 Release 3. This modification is shipped as a PTF.

Release 1 of the MVS/System Product will be supported as a guest operating system under the VM/System Product.

The cross-memory function of Release 3 of the MVS/System Product will be supported in the guest operating system environment under the level of the VM/System Product which is most current at the time of availability of Release 3 of the MVS/System Product. However, cross memory services will execute under the VM/SP without using the hardware/microcode implementation of the 3033 Extension (#6850). The single processor mode (SPM) and non-disruptive transition mode (NDT) features of VM/SP are supported with MVS/SP Release 3 only when the 3033 Extension feature is *not* installed.

The extended real addressing function of Release 3 is supported under the VM/System Product for guest use of a maximum of 16 megabytes of storage.

To use the functions provided by the resource measurement facility (RMF), the appropriate release of the OS/VS2 Resource Measurement Facility Version 2 program product (5740-XY4) is required. The MVS/SP releases and the required RMF Version 2 release are described below.

- MVS/SP Release 1 requires RMF Version 2 Release 3.
- The Release 1 Enhancement requires the RMF Version 2 Release 3 Enhancement.
- MVS/SP Release 3 requires RMF Version 2 Release 4 and the Enhancement to that release.

Refer to the Program Directory shipped with the MVS/System Product for the latest information concerning the PTFs required to install this product.

The use of the IBM 3800 Printing Subsystem Model 3 in all-points-addressable mode (full function mode) requires the installation of the following IBM licensed programs:

- Print Services Facility (5665-275)
- Print Management Facility (5665-307)
- Overlay Generation Language (5665-308)

## Virtual Storage Requirements

The minimum total storage required by the MVS/System Product depends on many factors. These include an installation's configuration, the subsystems, program product and problem programs in use. However, the following approximations will assist an installation in planning for MVS/SP.

The calculations and examples that follow are for planning purposes only. There is no guarantee that an individual installation will achieve these results.

Each row of Figure 3-1 shows the additional bytes of virtual storage required over the previous system. To estimate the additional bytes of virtual storage required in a particular system, use the combined total of the rows below the row representing the current system installed through and including the row representing the system being installed.

For example:

- The additional virtual storage required for an installation moving from MVS/System Extensions Release 1 to MVS/SP Release 3, is the combined total of rows for MVS/SE2 through MVS/SP Release 3.

- The additional virtual storage required for an installation moving from MVS/SP Release 3.2 to the MVS/SP Release 3.4 is the combined total of the rows for MVS/SP Release 3.3 and either the MVS/SP Release 3.4 for JES2 or JES3.

	Nucleus	PLPA	CSA	SQA	
				fixed	variable
MVS/SE2	6,200	66,300	Variable (Note 1)	--	(Note 2)
MVS/SP Release 1	10,500	-101,500 (minus) (Note 3)	--	4,000	--
MVS/SP Release 1 Enhancement	16,000	14,000	--	--	--
MVS/SP Release 3	170,000	110,000	Variable (Note 4)	43,000	--
MVS/SP Release 3.1	2,192	88	--	--	--
MVS/SP Release 3.2	72	48,998	Variable (Note 5)	--	--
MVS/SP Release 3.3	27,860	14,000	--	--	--
MVS/SP Release 3.4 (JES2 only)	--	500	2,000 (Note 6)	32,000 (Note 6)	
MVS/SP Release 3.4 (JES3 only)	--	18,000	Variable (Note 7)	--	--
MVS/SP Release 3.5	9,000	12,200	--	--	--

**Figure 3-1. MVS/System Product Virtual Storage Requirements**

*Notes:*

1. Assume 4 SMF buffers - requires an additional 8000 bytes.
2. The amount of additional storage required in SQA depends on several variables:
  - Assuming 50 address spaces with interval accounting, 2 recording data sets, and 3 subsystems defined to SMF, requires an additional 8000 bytes.
  - Subsystem transactions reporting requires a minimum of 4096 bytes.
  - The installation initial specification requires for each:
    - subsystem name, an additional 28 bytes
    - userid, transaction name, and transaction class, an additional 20 bytes.
3. This reflects a reduction in PLPA of 101,500 bytes. This step moves some infrequently referenced modules from LPALIB to LINKLIB.
4. This reflects a reduction in CSA. See the next topic, "Virtual Storage Reduction Examples," for information on this reduction in CSA.

5. *This amount is 512 bytes plus an additional 16 bytes for each SYSGENed console. For example, if there are 50 SYSGENed consoles, this amount would be 512 bytes plus  $50 \times 16 = 800$  bytes, or 1312 bytes.*
6. *This amount of additional storage applies for each functional subsystem (FSS) that is active.*
7. *Varies with respect to the initialization options selected and the workload processed. Factors that increase or decrease the CSA requirement are:*

*Increase in CSA requirement*

- *Number of devices*
- *Number of allocated SYSIN/SYSOUT data sets*
- *C/I FSS function*
- *Full-function support of IBM 3800 Model 3 Printing Subsystems*

*Decrease in CSA requirement*

- *Number of address spaces*

## **Virtual Storage Reduction Examples**

This section describes some examples of the potential virtual storage requirement reductions with MVS/SP Release 3. These examples do not take into account any added virtual storage requirements listed in Figure 3-1. To calculate any *net* decreases (or increases) in overall system virtual storage, combine the storage requirement reductions, given in the examples below, with the virtual storage requirements from Figure 3-1.

### **Communications Task**

The communications task control blocks for message queues, console message queueing, and display screens have been moved from the common service area (CSA) to the private area of the communications task address space. Message queue control blocks are 192 bytes, console message queueing control blocks are 24 bytes, and display screen control blocks are variable sized, depending on the type of console. The potential reduction of required CSA is (192 bytes x the number of messages queued + 24 bytes x the number of console queueing blocks + a variable amount x the number of consoles).

For example, a 3033MP processor with fifteen 3278-4 consoles (each requiring 5.1K for display screen control blocks) and an average of 200 messages queued, would potentially save 114K bytes of required CSA space. Under transient conditions the savings can be greater. For example, if ten of the fifteen consoles issued a command for a 100 line display, then the potential savings would be 137K bytes of CSA space. This is the maximum potential savings for this example.

## Global Resource Serialization

The use of cross memory services by global resource serialization allowed the ENQ/DEQ control blocks to be moved from the system queue area (SQA) to the private area of the global resource serialization address space. The length of the control blocks is variable depending on the length of the data set name being serialized and the type of serialization requested. The amount of SQA savings depends on the size of the control blocks and the amount of ENQ/DEQ activity.

For example, a TSO/batch workload running on a 3033 UP with 90 TSO users, 15 batch initiators, and an average data set name length of 16 characters, may save 67K bytes of required SQA storage. The actual savings are dependent on such factors as the installation workload and data set naming conventions.

## JES3

JES3's use of CSA virtual storage may be substantially reduced through the use of cross memory services and a JES3 auxiliary address space. This allows for expanded system area or private area for other subsystems, new applications, or current application growth.

On a system basis, users can optionally specify that one or both of two types of JES3 data areas (USAM protected buffers and secondary staging area extents), each of which use significant amounts of CSA, be allocated in the JES3 auxiliary address space. The CSA cost per USAM buffer is 244 bytes whether or not the virtual storage savings option is used. Additionally for each open SYSIN/SYSOUT data set there is a 100-byte CSA savings.

A JES3 processor (global or local) on a 3033 UP may achieve the following CSA reductions:

- If the installation specifies a primary staging area of 50K bytes and 10 extents of 85K bytes each for secondary staging areas, then the requirement for 850K bytes of CSA is eliminated.
- If the installation specifies 240K bytes of 2K byte USAM protected buffers to be allocated in the JES3 auxiliary address space, the CSA requirement will be reduced by 240K bytes. After subtracting the 224 byte per buffer cost of 27K bytes, the net CSA requirement is reduced by 213K bytes.
- If there are 800 open SYSIN/SYSOUT data sets on the system, the CSA requirement will be reduced by 80K bytes.

The example above accounts for a reduction of 1,143K bytes of required CSA, which is the maximum possible JES3 CSA reduction for this example. The actual saving is dependent on the installation's configuration and workload.

In MVS/SP 1 Release 3.4, JES3 installations can optionally move a portion of conversion/interpretation (C/I) processing to one or more new address spaces, called functional subsystem address spaces. These address spaces can be located on the global processor, on one or more local processors, or on any combination of the global and local processors.

## JES2

In MVS/SP Release 3.3, JES2 reduces the amount of CSA storage required for JES2 subsystem job blocks (SJBs). Previously, each SJB was 900 bytes + 16 bytes for each spool volume. This meant that each page of CSA storage could contain 4 SJBs in a complex using 7 or fewer spool volumes or 3 SJBs in a complex using 8 or more spool volumes. (An SJB normally does not span a page boundary.) The information in SJBs is now split into two parts; a fixed portion of 296 bytes that resides in CSA storage and a new control block, the subsystem job extension (SJBX), that is 1144 bytes long and resides in the user's private storage. As a result, one page of CSA storage can now contain 13 SJBs.

The actual amount of CSA savings depends on the number of spool volumes and the amount of work being handled in the system. One SJB is required for each started batch initiator, active batch job, logged-on TSO user, and started task.

For example, a system using 6 spool volumes that has 25 started batch initiators, 20 active batch jobs, 75 logged-on TSO users, and 10 active started tasks can save 23 pages or 92K bytes of CSA storage. A system using 9 spool volumes that has 45 started batch initiators, 40 active batch jobs, 200 logged-on TSO users, and 12 active started tasks can save 76 pages or 304K bytes of CSA storage. These figures assume that the remaining space in each page is not being used by other system tasks or applications.

In MVS/SP Release 3.4, JES2 relieves the constraint on virtual storage by allocating processor control elements (PCEs) in a different way. JES2 allocates virtual storage for remote device PCEs only when the remote is signed on (BSC SIGNON or SNA LOGON) or when the remote is automatically started (BSC dedicated line or SNA AUTOLOGON).

The amount of virtual storage savings depends on the number of remote devices defined and whether or not they are signed on. For example, an installation with 1000 remote work stations, with each having one printer and one reader, can save up to 900K bytes of virtual storage or more when only 300 remote work stations are logged on at any one time.

*Note:*

If remote work stations logon and logoff periodically, Some of the virtual storage savings might be nullified.

## IMS/VS

IMS/VS Version 1 Release 2 uses cross memory services to implement the local storage option (LSO). The LSO facility allows the installation to optionally move IMS modules, buffers, and working storage areas of the IMS/VS subsystem from CSA to the private area of the IMS/VS control region. The specific buffers and working storage areas are:

- Dynamic log buffers
- Dynamic logger work area
- Working storage (general pool)
- ISAM/OSAM buffer pool
- Disk log buffers \*\*

- Logger work area and buffers \*\*
- ENQ/DEQ control blocks \*\*

*Note:* For IMS/VS installations using the fast path feature, approximately 9K bytes of IMS modules plus buffers (as indicated with \*\* above) and working storage that are associated with fast path data bases, are not moved out of CSA.

A reduction of 880K bytes of required CSA including 200K bytes of IMS/VS modules moved out of CSA, may be achieved by an IMS/VS installation with the environment described below, if LSO is invoked.

- 508K of ISAM/OSAM buffers
- 86K of ENQ/DEQ control buffers
- 15K of disk log buffer/logger work areas and buffers
- 51K of dynamic log buffers/dynamic logger work area
- 20K of working space.

The above example could represent a virtual storage constrained IMS/VS environment running on a 3033 UP with 15 active dependent regions and no fast path feature.

This example shows the potential virtual storage savings for an IMS/VS environment, the actual savings depends on the installation's selection of parameters.

## Compatibility

Program products that currently run with MVS Release 3.8 should continue to run with any MVS/System Product installed. APARs will be accepted for the MVS/System Product when any such IBM program product does not run successfully.

Release 1 of the MVS/System Product is supported with the following JES products:

- MVS/SP-JES2 supports JES2 Release 4.1 or NJE for JES2 Release 3 program product (5740-XR8), with or without the 3800 enhancements.
- MVS/SP-JES3 supports JES3 Release 3, including the networking PRPQ (5799-AZT), with or without the 3800 enhancements.

The above JES releases will also be supported for migration purposes, by Release 3 of the MVS/System Product.

With MVS/System Product Release 3, modules managed by virtual fetch cannot issue a checkpoint/restart. In addition, job steps that call virtual fetch cannot issue a checkpoint/restart.

Installations that use IBM private macro libraries (PVTMACS) as part of macro library concatenations should review the MVS/SP Release 3 and Release 3.1 program directory. Certain macros have been moved from PVTMACS to AMODGEN for MVS/SP Release 3 and Release 3.1.



For additional compatibility considerations that apply to users migrating to MVS/System Product Release 3, see *MVS/SP Version 1 Conversion Notebook*, GC28-1122.

Release 3.1 of the MVS/System Product supports a new version of the Interactive Problem Control System (IPCS).

With Release 3.5, to ensure that the allocation of SYS1.PAGEDUMP is large enough to contain the new records that have been added to it, users must regenerate their AMDSADMP program and use the newly created stage 2 JCL to execute AMDSADMP.

The CONSOLE keyword allows specification of multiple console addresses, rather than just one specified console device. The operator must now press the ENTER or ATTN key to signal which console to use.

An installation installing MVS/SP 1.3.5 in a global resource serialization complex must add a GRSRNL=00 parameter to the IEASYSxx member of SYS1.PARMLIB or specify GRSRNL=00 in response to message IEA101A SPECIFY SYSTEM PARAMETERS. The GRSRNL00 member supplied in MVS/SP 1.3.5 causes the RNL list to be loaded from SYS1.LINKLIB, as was done in previous releases.

## **IOCP Considerations for MVS/SP 1.3.5**

Installations with VM/370 supporting the extended channel function can no longer create a common input deck for use with IOCP and MVS/370 system generation. Two input decks are required — one for IOCP and one for MVS/370 — because MVS/370 does not support more than 16 channels per channel set. For additional conversion information about IOCP in MVS/SP 1.3.5, see *Input/Output Configuration Program User's Guide and Reference*.

## **JES3**

MVS/SP-JES3 Release 3 does not support ASP processors or NJP (network job processing).

When implementing new JES3 functions supported by Release 3.1 of the MVS/System Product, several special considerations must be made by the user as follows:

- For the SMF exploitation, which changes the method of invocation of this option, a reevaluation of data being collected should be made.
- Verify and evaluate exit points being utilized as several are renamed and new exit points are available.
- Writer output multitasking has expanded storage resident control blocks.
- Two functions require new initialization parameters:
  - DD statement limits
  - Writer output multitasking

- Several initialization parameters involved with the ASP/NJP disablement have been deleted.

For specific details concerning these Release 3.1 items, refer to *JES3 SPL: User Modifications and Macros* and *JES3 SPL: Installation, Planning and Tuning*.

When installing and operating the JES3 functions supported by Release 3.4, installations should consider the following:

Because of changes to the format and content of spool records:

- Installation of Release 3.4 requires a cold start of the JES3 complex.
- Release 3.4 cannot coexist with previous JES3 levels in the same complex. The JES3 global and locals must be at the same level of JES3.

When migrating from Release 3.1 to Release 3.4, the new translation facility of dump job can be used to convert spool control blocks from the Release 3.1 format to the Release 3.4 format and back.

Installations must assemble user exits, user-written DSPs, and user-written modifications to JES3 source code with the macros distributed with Release 3.4. They should read carefully all JES3 publications associated with this release.

In addition to the new functions discussed in Chapter 2, installations should also consider the following:

#### ***Spool Constraint Relief***

- Up to 1024 spool volumes are now allowed.
- The JCT extent size must be increased.
- The number of primary STT extents should be decreased, and the amount of each primary extent should be increased.
- User programs currently using the FDB must accommodate the new FDB structure and use the new FDB mapping macro, IATYFDB.
- User control blocks that are written to spool should use the IATYSRF macro.
- Using the `//*MAIN` control statement, users can request allocation quantities for spool space for a specific job that override the allocation quantities JES3 would otherwise apply to a job.

#### ***Spool Partitioning Enhancements***

- The master track allocation table (MTAT) is replaced by the partition track allocation table (PTAT). A PTAT exists for each partition defined to JES3.

### ***\*VARY Command***

- The operator no longer needs to enter separate JES3 and MVS commands to set device status on or off; he can set it using only the JES3 command.

### ***Conversion Facility***

- Module IATDJCR must be renamed IATDJOR and copied into a Release 3.4 library to be used.

### ***JCL Statement Limit Processing***

- Operator commands that controlled DD limit values are replaced by commands that control JCL limit values.

### ***Procedure Library Processing Enhancements***

- `//*MAIN UPDATE=` changes from the specification of a PROCLIB ID to one or more PROCLIB data set names. The specification of an ID will cause the job to fail.
- Users can update one or more of the concatenated data sets in a procedure library.

### ***Internal Reader Job Defaults***

- Installations can now define a separate set of defaults for jobs submitted through the internal reader.

### ***Use of the C/I Functional Subsystem***

- Offloaded C/I functions make the C I DSP sensitive to which address space the DSP is running in; all existing user exits called by the offloaded C/I functions can now be called from either the JES3 global or an FSS address space. Users must make sure that the routine will run in both environments.
- New operator commands are available to exercise the new C/I capabilities.

### ***Use of the Writer Functional Subsystem***

- User exits IATUX20 through IATUX23 are not invoked when the writer is running under control of an FSS. Exit IATUX45 is invoked prior to sending each data set to an FSS for processing.
- The Print Service Facility program product provides exits for job and/or data set header and job trailer processing for an output being processed by an FSS.
- The writer functional subsystem uses buffers from the JES3-protected buffer pool. Therefore, when defining the size of the JES3 buffer pool via the `PRTPAGE` parameter of the `MAINPROC` initialization statement, an installation must take into account the number of output writer FSSs it plans to use.

### *Tailoring of JES3 Initialization Statements*

- The STANDARDS statement subparameter under the CICNT parameter is changed from (batch/demand-select,tso) to (batch,demand-select/tso).
- The STANDARDS statement parameter MAXJOBDD is changed to MAXJOBST and now defines the maximum number of JCL statements allowed for a job.
- The STANDARDS statement parameter MAXSYSDD is changed to MAXASST and now defines the maximum number of currently addressable and processable JCL statements for the JES3 global address space.
- The BUFFER initialization statement parameters TAT and TKLIM are replaced by the GRPSZ and SPLIM parameters, respectively.
- The BUFFER initialization statement stream parameter PAGES is modified to include three subparameters (global, local, and cifss).
- The OPTIONS initialization stream statement parameter JOBNO now specifies the maximum number of jobs that may be in the JES3 complex at a given time. It formerly specified the maximum number of JCT records that could be made resident.
- JES3 attempts to get the MVS and JES3 status for each device to agree, based on the on/off status in XUNIT and JUNIT parameters of the appropriate DEVICE statement.
- Installations should be aware that JES3 now includes initialization statements for the MVS/Bulk Data Transfer Facility (MVS/BDT) program product (5665-302).

## **JES2**

When installing and operating the JES2 component of Release 3.3, installations should consider the following:

- User-written routines may have to be reworked because of the following:
  - Changes to the interface for Exit 9, Job Output Overflow. JES2 now uses a parameter list to pass information to the exit routine.
  - Changes to the \$MODULE and \$MODEND macros.
  - New, changed, and deleted JES2 macros. (See Chapter 3 for a list of the new and changed macros.)
  - Information that was previously located in the track extent data table (TED) is now located in the direct access spool control block (DAS).
  - New, changed and deleted JES2 control blocks. (Licensees will receive documentation on the MVS/SP Release 3.3 control blocks.)

- Changes to the structure of many JES2 modules including all of initialization.
- Changes to the sequence numbers used in all JES2 modules.
- Changes to the equates used in all JES2 modules.
- Installations can no longer add spool volumes during a configuration-wide warm start. Spool volumes must be added using the \$\$ SPOOL command.
- The following initialization statements can no longer be used:

&ESTLNCT	&OUTPOPT	\$SYSJCL
&ESTPUN	&TIMEXS	&MINJOES
&ESTIME	&TIMEOPT	OUTPUT
&OUTXS	&PRTYOPT	

New and changed initialization and JCL statements now perform their functions.

- The formats of the COMPACT AND EXITnnn initialization statements are changed.
- The OPERATOR/AUTO parameter is deleted from the device initialization statements.
- The CKPTPGS and CKPTLNS keywords on the device initialization statements are now spelled CKPTPAGE and CKPTLINE.
- The default values are changed for the &RDROPSU, &SPOOL, and &CHKPT initialization statements and the CKPTPAGE parameter on the device initialization statements.
- The algorithms used to select output for processing are changed.
- Job and output data set priorities are handled in new ways. In addition, both the job queue and output queue are priority aged.
- JES2 now generates internal jobs for all system data sets that reside on spool, such as the JESNEWS and remote messages data sets.
- Several messages are changed.
- Messages issued during initialization processing are now routed to both the system programmer and operator.

When installing the JES2 components of Release 3.4, the following programming considerations apply:

- A warm start is only required to initialize the system at the Version 1 Release 3.4 level when migrating from the Version 1 Release 3.3 level.
- A header page exit routine exists in the Print Services Facility for 3800 Printing Subsystem Model 3 support operating in full-function mode. The JES2 header exit routine (exit 1) is incompatible with this new exit.

- The JES2 spool access method (HAM) now supports carriage control characters specified for records larger than 256 bytes.
- The PRINTERnn initialization statement is changed to support functional subsystems.
- A new FSSDEF initialization statement is used to define functional subsystems.
- A new exit point, exit 23, is provided to modify information contained in the control block used by the Print Services Facility when formatting the header page. This exit is invoked from the functional subsystem (Print Services Facility) address space.
- A new exit point, exit 25, is provided for JCT I/O that occurs in the functional subsystem address space. Exit 25 is similar to exits 7 and 8.

## Programming Notes

### Operation Codes

With MVS/SP Release 3, the following operation codes now have meaning and execute control program functions: B218, B219, B223, B224, B225, B226, B227, B228, B229, B22A, B22B, B22C, B242, D9, DA, DB, and E500. Prior to MVS/SP Release 3 these operation codes were invalid.

# Module Lists

This section lists the modules and macros shipped for the MVS/System Product.

## MVS/SP Release 1

This section lists new and changed modules and macros shipped for MVS/SP Release 1 plus the modules and macros included from MVS/System Extensions Release 2.

### MVS Modules

AHLMCIH	IEAVEEE2	IEAVMQWR	IEAVTSIG	IEECVETG
AHLSBUF	IEAVEEXP	IEAVNIPM	IEAVTSLB	IEECVETH
AHLDIR	IEAVEEXT	IEAVNIPX	IEAVTSLC	IEECVETK
AHLTEXT	IEAVEE1R	IEAVNIP0	IEAVTSLP	IEECVETP
AHLTFOR	IEAVEE2R	IEAVNPF2	IEAVTSLR	IEECVETQ
AHLTPID	IEAVEINT	IEAVNPM2	IEAVTSLS	IEECVETR
AHLTSIO	IEAVEIO	IEAVNPS5	IEAVTSL1	IEECVETU
AHLTSVC	IEAVELIT	IEAVNP03	IEAVTSL2	IEECVETV
AHLTSYFL	IEAVELK	IEAVNP05	IEAVVINT	IEECVET1
AHLTSYSM	IEAVELKR	IEAVNP08	IECIHIO	IEECVET3
AHLTUSR	IEAVEMCR	IEAVNP10	IECIOSAM	IEECVET4
AHLTXSYS	IEAVEMDL	IEAVNP47	IECLMSGD	IEECVFTA
AMASPZAP	IEAVEMIN	IEAVOUT	IECVCRHH	IEECVFTB
AMDPRCVT	IEAVEMRQ	IEAVPCB	IECVDPTH	IEECVFTR
AMDPREID	IEAVEMS0	IEAVPFTE	IECVERPL	IEEC2740
AMDPRFAR	IEAVENQ1	IEAVPIOI	IECVERPT	IEEDISPD
AMDPRFCB	IEAVEOR	IEAVPIOP	IECVESIO	IEEMB810
AMDPRFXT	IEAVEPC	IEAVPIX	IECVEXCP	IEEMB811
AMDPRGCD	IEAVEPDR	IEAVPREF	IECVGENA	IEEMB812
AMDPRMST	IEAVEPD0	IEAVPRSB	IECVHDET	IEEMB813
AMDPRSCN	IEAVEQR	IEAVPRT0	IECVHIDT	IEEMB820
AMDPRSUM	IEAVERES	IEAVPSI	IECVHREC	IEEMB821
AMDSADER	IEAVERI	IEAVQ700	IECVIOPM	IEEMB822
AMDSAPRO	IEAVERP	IEAVRCF	IECVIOSI	IEEMB823
AMDSARSM	IEAVESCR	IEAVRCV	IECVIRST	IEEMB824
AMDSASIN	IEAVESCO	IEAVRELS	IECVLCHA	IEEMB825
AMDSASIO	IEAVESPR	IEAVRFR	IECVPST	IEEMB826
AMDSAUPD	IEAVESVC	IEAVRSM	IECVRDIO	IEEMB827
IEAFTIHS	IEAVESVT	IEAVRTI0	IECVRRSV	IEEMB828
IEASMFEX	IEAVETCL	IEAVRTI1	IECVRSTI	IEEMB829
IEASMFSP	IEAVEVAL	IEAVRTOD	IECVSMGR	IEEMB830
IEATLEXT	IEAVEVRR	IEAVRT00	IECVTCCW	IEEMB831
IEAVAD0	IEAVEVT0	IEAVSETS	IECVURDT	IEEMB832
IEAVAD00	IEAVEXS	IEAVSOUT	IECVURSV	IEEMB833
IEAVAD03	IEAVFP	IEAVSQA	IECVXDAS	IEEMB834
IEAVAD06	IEAVFREE	IEAVSTAA	IECVXDRS	IEEMB835
IEAVAMSI	IEAVFRLK	IEAVSTA0	IECVXSKS	IEEMB836
IEAVAR02	IEAVFXLD	IEAVSWIN	IECVXVRS	IEEMB837
IEAVAR03	IEAVGFA	IEAVSY50	IEECB800	IEEMB838
IEAVAR04	IEAVID00	IEAVTACR	IEECB801	IEEMB839
IEAVCSEG	IEAVINV	IEAVTAS3	IEECB804	IEEMB842
IEAVC700	IEAVIOCP	IEAVTERM	IEECB866	IEEMB846
IEAVEAC0	IEAVITAS	IEAVTMMT	IEECB900	IEEMB848
IEAVEAT0	IEAVLK00	IEAVTMTC	IEECB901	IEEMB860
IEAVECBV	IEAVLK01	IEAVTPER	IEECB904	IEEMB876
IEAVECHO	IEAVLK02	IEAVTRCE	IEECB910	IEEMPDM
IEAVEDR	IEAVLK03	IEAVTRTM	IEECB911	IEEMPS03
IEAVEDSR	IEAVMDOM	IEAVTRTR	IEECB912	IEEPALTR
IEAVEDS0	IEAVMDSV	IEAVTRTS	IEECB916	IEESTPRS
IEAVEED0	IEAVMED2	IEAVTRT1	IEECLEAN	IEEVCPU
IEAVEEER	IEAVMFRR	IEAVTSDT	IEECVETC	IEEV-
IEAVEEE0	IEAVMODE	IEAVTSDX	IEECVETD	DCCR

IEEVJCL	IEE7503D	IEFNB903	IFDOLT30	ILRSRBC
IEEVLDWT	IEE7903D	IEFSD103	IFDOLT62	ILRSRT
IEEVPTH	IEE8103D	IEFSD160	IGC0001F	ILRSRT01
IEEVSTAR	IEE8603D	IEFSD161	IGC0003C	ILRSWAP
IEEVWAIT	IEE90110	IEFSD162	ESRTABLE	ILRSWPDR
IEEVWKUP	IEFAB421	IEFSD263	IGE0025C	ILRSWP01
IEEXEDNA	IEFAB422	IEFSMFIE	IGFPEXIT	ILRTERMR
IEE0003D	IEFAB424	IEFSMF30	IGFMCIH	ILRTMI01
IEE0403D	IEFAB429	IEFSMF32	IGFPMRTM	ILRTMRLG
IEE0503D	IEFAB431	IEFTB721	IGFPSAD0	ILRVIOCM
IEE0603D	IEFAB434	IEFTB722	IGFPTCON	ILRSVAMI
IEE10110	IEFAB488	IEFTB724	IGFPTREC	IRARMANL
IEE2303D	IEFAB49B	IEFTB726	IGFTMCHK	IRARMCNS
IEE2903D	IEFAB490	IEFTB727	IGFTMC00	IRARMCPM
IEE3103D	IEFAB492	IEFTB728	IGX00025	IRARMCPU
IEE3303D	IEFAB494	IEFUJI	ILRACT	IRARMCTL
IEE3503D	IEFAB820	IEFUJV	ILRASRIM	IRARMERR
IEE3603D	IEFACTRT	IEFUSI	ILRFMTCV	IRARMEVT
IEE4203D	IEFBB4M3	IEFUTL	ILRFMTPG	IRARMEV2
IEE4403D	IEFBB404	IEFU29	ILRMTSW	IRARMFIP
IEE4603D	IEFDB4A1	IEFU83	ILRFMT00	IRARMICS
IEE4703D	IEFDB4F8	IEFU84	ILRFRR01	IRARMINT
IEE4803D	IEFDB4F9	IEFVEA	ILRGOS	IRARMIOM
IEE4903D	IEFDB402	IEFVHEB	ILRGOS01	IRARMIPM
IEE5403D	IEFDB413	IEFVHF	ILRIMMSG	IRARMIPS
IEE5603D	IEFDB450	IEFVHH	ILRIOFRR	IRARMMSG
IEE5903D	IEFDB460	IEFVHN	ILROPS00	IARAMOPT
IEE6303D	IEFENFDM	IEFVH1	ILRPAGCM	IRARMRMR
IEE6403D	IEFENFFX	IEFVJA	ILRPAGIO	IRARMSET
IEE6503D	IEFENFNM	IFARPORT	ILRPGEXP	IRARMSRV
IEE6603D	IEFENFWT	IFASMFDR	ILRPOS	IRARMSTM
IEE6703D	IEFIB600	IFBSVC76	ILRPTM	IRARMST2
IEE6903D	IEFIB621	IFCDIP00	ILRQSRIT	IRARMWAR
IEE7011D	IEFIB660	IFDOLT00	ILRRLG	IRARMWLM
IEE7303D	IEFJCNTL	IFDOLT12	ILRSVAV	IRARMWLS

## MVS Macros

ADJTCBQ	IEECSUB	IHAMPL	IMDMEDIT	SGIEA402
AMDSADMP	IEECUCM	IHAOUSB	INTSECT	SGIEA502
AMDSADM2	IEESMCA	IHAOUSB	IOSGEN	SGIEC202
CALLDISP	IEEXSA	IHAPSA	IRAOUUB	SGIEC300
CLN1126A	IEFAJCTB	IHAPVT	PGFIXA	SGIEE0MS
CLN1126B	IEFALLCT	IHARB	PGFREEA	SGIEF300
CVT	IEFASCTB	IHARSMH	PROTPSA	SGIEF440
ESTAE	IEFJMR	IHASCB	RESUME	SGIEF441
EWAMAP	IEFNEL	IHASDWA	RPSGNL	SGIFB600
IEAIPL00	IEFTCT	IHASGTE	SCHEDULE	SMFDETAL
IEAIPS00	IEFUCBOB	IHASRB	SETFRR	SMFEWTM
IEAOPT00	IFASMFR	IHASU50	SETLOCK	SMFEXIT
IEAPMP	IFASMFR2	IHASU65	SGFDSP04	SMFFRMT
IEAVBK	IFASMFR1	IHASU74	SGIDSP04	SMFINTVL
IECDIOCM	IFASMFR3	IHASVT	SGIEA2D1	SMFPRM00
IECDIOSB	IFASMFR3	IHATRBPL	SGIEA2D2	SMFRTEST
IECICS	IHAASCB	IHATREPL	SGIEA200	SMFTSOCM
IECVNUCB	IHAASVT	IHAVRA	SGIEA202	STATUS
IECVUCB	IHACMS	IHAWPRB	SGIEA300	SYSEVENT
IECXTCH	IHACTM	IHAWSAVT	SGIEA4D1	TESTEXIT
IEEBASEA	IHAHSA	IHLMGTRC	SGIEA4D2	TESTPROT
IEECDCM	IHALCCA	IKJRB	SGIEA400	TSEVENT
IEECRDCM	IHAMBCB	IKJTBC	SGIEA401	UCL1126A
				UCL1126B
				WINDOW



## MVS/SP Release 1 Enhancement

This section lists new and changed modules and macros shipped for the MVS/SP Release 1 Enhancement.

### MVS Modules

AHLSBLOK	ICPCWTDS	IEAVRTI1	IEEVALST	IGFPBUCR
AMDPRCVT	ICPPCNTL	IEAVRTOD	IEEVCPR	IGFPTERM
AMDPRGCD	IEAVEEXT	IEAVSWCH	IEEVCPRP	IGFPTREC
AMDSADER	IEAVEINT	IEAVTACR	IEEVCPU	IGFPWMSG
AMDSADM2	IEAVELK	IEAVTCRI	IEEVLDDWT	IGFRWAC
AMDSAPRO	IEAVELKR	IEAVTFTM	IEEVMESS	IGFTMC00
AMDSASIO	IEAVEMS0	IEAVTMMT	IEEVPTH	IGF2603D
ICFBDF00	IEAVEPC	IEAVTRCE	IEEVSTEE	ILRSARIM
ICFBIF00	IEAVINV	IEAVTSKT	IEEVSTEL	ILRCMP
ICPCARDS	IEAVMFIH	IECIHIO	IEEVSTFA	ILRFMTPG
ICPCGET	IEAVMFRM	IECIOSAM	IEEVSTGL	ILRFMTSW
ICPCGNDS	IEAVMSF	IECVEXCP	IEEVSTGP	ILRFRR01
ICPCINIT	IEAVNPE6	IECVEXPR	IEEVSTOR	ILRFRSLT
ICPCIOCP	IEAVMSFS	IECVIOPM	IEEVSTPE	ILROPS00
ICPCIOCU	IEAVNIPM	IECVLCHA	IEEVSTRE	ILRPGEXP
ICPCIODV	IEAVNIP0	IECVXDAS	IEEVWAIT	ILRSRT
ICPCMSG	IEAVNP02	IECVXDRS	IEEVWKUP	ILRSRT01
ICPCPUT	IEAVRCF	IEECLEAN	IFBSVC76	ILRSWAP
ICPCRDDS	IEAVRCF3	IEEMPDM	IFCDIP00	ILRSWPDR
ICPCRPT	IEAVRCV	IEEMPVST	IFDOLT62	ILRSWP01
ICPCRTNS	IEAVRSM	IEEMTEXT	ESRTABLE	IRARMCPU

### MVS Macros

CVT	IECDIOSB	IHALCCA	SGICP400	SGIEA401
IEAIPL00	IECDRQE	IHAPSA	SGIEA300	SGIEA502
IECDDT	IECDXCPS	IHAPVT	SGIEA400	SGIFB600
				WINDOW

## MVS/SP Release 3

This section lists new and changed modules and macros shipped for MVS/SP Release 3 plus the modules and macros included from MVS/System Extensions Release 2, MVS/SP Release 1, and the Release 1 Enhancement.

### MVS Modules

AHLMCER	AHLVCOFF	AMDPRPCR	CSVVFCRE	ICPCIODV
AHLMCIH	AHLVCON	AMDPRPMS	CSVVFCR1	ICPCMSG
AHLSBLOK	AHLWTO	AMDPRRDC	CSVVFGET	ICPCPUT
AHLSBUF	AMASPZAP	AMDPRSCN	CSVVFINO	ICPCRDDS
AHLSETEV	AMDPRCMC	AMDPRSEG	CSVVFMEM	ICPCRPT
AHLTDIR	AMDPRCOM	AMDPRSUM	CSVVFRSH	ICPCRTNS
AHLTEXT	AMDPRCTL	AMDPRUIM	CSVVFSCH	ICPCWTDS
AHLTFOR	AMDPRCVT	AMDPRXMT	CSVVFTCH	ICPPCNTL
AHLTMMSG	AMDPRDPS	AMDSADER	ESRTABLE	IEAFTEED
AHLTMON	AMDPREAD	AMDSAGSM	IASXSD82	IEAFTHHS
AHLTPID	AMDRECT	AMDSAPGE	ICFBDF00	IEAFTRT2
AHLTSIO	AMDPREID	AMDSAPRO	ICFBIF00	IEAFTSCB
AHLTSLIP	AMDPRFAR	AMDSARSM	ICPCARDS	IEAFTXSB
AHLTSVC	AMDPRFCB	AMDSASIN	ICPCARDX	IEASMFEX
AHLTSYFL	AMDPRFSC	AMDSASIO	ICPCGET	IEASMFSP
AHLTSYSM	AMDPRFXT	AMDSASVI	ICPCGNDS	IEATLEXT
AHLTUSR	AMDPRGCD	AMDSAUPD	ICPCINIT	IEAVAD0B
AHLTVTAM	AMDPRLOD	AMDSAVCK	ICPCIOCP	IEAVAD0C
AHLTXSYS	AMDPRMST	AMDSYS04	ICPCIOCU	IEAVAD00

IEAVAD01	IEAVEVAL	IEAVPIX	IEAVTSDH	IECVGENA
IEAVAD03	IEAVEVRR	IEAVPREF	IEAVTSDI	IECVHDET
IEAVAD05	IEAVEVT0	IEAVPRSB	IEAVTSDL	IECVHIDT
IEAVAD07	IEAVEXMS	IEAVPRT0	IEAVTSDO	IECVHREC
IEAVAMSI	IEAVEXS	IEAVPSI	IEAVTSDR	IECVIOPM
IEAVAR00	IEAVFP	IEAVQ700	IEAVTSDT	IECVIOSI
IEAVAR02	IEAVFREE	IEAVRCF	IEAVTSDU	IECVIRST
IEAVAR03	IEAVFRLK	IEAVRCF3	IEAVTSDW	IECVLCHA
IEAVAR04	IEAVFXLD	IEAVRCV	IEAVTSDX	IECVOID
IEAVCARR	IEAVGCAS	IEAVRELS	IEAVTSFR	IECVPST
IEAVDSEG	IEAVGFA	IEAVRFR	IEAVTSIG	IECVRDIO
IEAVCSEG	IEAVGFAX	IEAVRSM	IEAVTSKT	IECVRRSV
IEAVC700	IEAVGFRR	IEAVRTI0	IEAVTSLB	IECVRSTI
IEAVDLAS	IEAVGM00	IEAVRTI1	IEAVTSLE	IECVRSTS
IEAVCKEY	IEAVGM03	IEAVRTOD	IEAVTSLP	IECVSMGR
IEAVEAC0	IEAVGM04	IEAVRT00	IEAVTSLR	IECVTCCW
IEAVEAT0	IEAVGPRR	IEAVRT03	IEAVTSLS	IECVURDT
IEAVEBBR	IEAVH600	IEAVSETS	IEAVTSL1	IECVURSV
IEAVECBV	IEAVID00	IEAVSOUT	IEAVTSL2	IECVXDAS
IEAVECH0	IEAVINV	IEAVSQA	IEAVTSR1	IECVXDRS
IEAVECMS	IEAVIOCP	IEAVSTAA	IEAVTSSD	IECVXSKS
IEAVEDR	IEAVITAS	IEAVSTA0	IEAVTSSE	IECVXVRS
IEAVEDSR	IEAVLKRM	IEAVSWCH	IEAVTSSH	IEEAB400
IEAVEDS0	IEAVLK00	IEAVSWIN	IEAVTSSM	IEEAB401
IEAVEED0	IEAVLK01	IEAVSWPC	IEAVTSSV	IEEBASEC
IEAVEEER	IEAVLK02	IEAVSWPP	IEAVTSSX	IEECB800
IEAVEEEE	IEAVLK03	IEAVSY50	IEAVTSXT	IEECB801
IEAVEEE2	IEAVMDOM	IEAVTABD	IEAVVCTR	IEECB804
IEAVEEXP	IEAVMDSV	IEAVTABI	IEAVVINT	IEECB805
IEAVEEXT	IEAVMED2	IEAVTACR	IEAVVRP2	IEECB806
IEAVEE1R	IEAVMFIH	IEAVTADR	IEAVVWTO	IEECB807
IEAVEE2R	IEAVMFRM	IEAVTAS1	IEAVWND	IEECB808
IEAVEE3R	IEAVMFRR	IEAVTAS2	IEAVXDOM	IEECB811
IEAVEINT	IEAVMODE	IEAVTAS3	IEAVXECO	IEECB866
IEAVEIO	IEAVMQWR	IEAVTCR1	IEAVXECR	IEECB900
IEAVEIOR	IEAVMSF	IEAVTERM	IEAVXEDE	IEECB901
IEAVELIT	IEAVMSFS	IEAVTFHX	IEAVXEDI	IEECB904
IEAVELK	IEAVMWSV	IEAVTFMT	IEAVXEPM	IEECB905
IEAVELKR	IEAVMWTO	IEAVTFRD	IEAVXLFR	IEECB907
IEAVEMCR	IEAVM700	IEAVTFRT	IEAVXLRE	IEECB908
IEAVEMDL	IEAVNIPM	IEAVTFTM	IEAVXMAS	IEECB909
IEAVEMIN	IEAVNIPX	IEAVTFXM	IEAVXMIN	IEECB910
IEAVEMRQ	IEAVNIP0	IEAVTGLB	IEAVXNEP	IEECB911
IEAVEMS0	IEAVNPA6	IEAVTLCL	IEAVXPAM	IEECB912
IEAVEOR	IEAVNPE6	IEAVTMMT	IEAVXPCR	IEECB913
IEAVEPC	IEAVNPF2	IEAVTMRM	IEAVXRFE	IEECB916
IEAVEPCO	IEAVNPF5	IEAVTMTC	IEAVXSEM	IEECLEAN
IEAVEPCR	IEAVNPM2	IEAVTPER	IEAVXSET	IEECVETC
IEAVEPDR	IEAVNPM3	IEAVTPMT	IEAVXSFM	IEECVETD
IEAVEPD0	IEAVNPS5	IEAVTRCE	IEAVXSTK	IEECVETF
IEAVEQR	IEAVNPX1	IEAVTRER	IECIHIO	IEECVETG
IEAVEQV0	IEAVNP02	IEAVTRMC	IECIOSAM	IEECVETH
IEAVERES	IEAVNP03	IEAVTRS0	IECLMSGC	IEECVETJ
IEAVEREX	IEAVNP05	IEAVTRTC	IECLMSGD	IEECVETK
IEAVERI	IEAVNP08	IEAVTRTE	IECLMSGG	IEECVETP
IEAVERP	IEAVNP09	IEAVTRTH	IECLMSGM	IEECVETQ
IEAVESCR	IEAVNP10	IEAVTRTM	IECLMSGT	IEECVETR
IEAVESCO	IEAVNP13	IEAVTRTR	IECLMSGU	IEECVETU
IEAVESPI	IEAVNP47	IEAVTRTS	IECFCINT	IEECVETV
IEAVESPM	IEAVNP57	IEAVTRT1	IECVCRHH	IEECVET1
IEAVESPR	IEAVN700	IEAVTRT2	IECVDPTH	IEECVET3
IEAVESRT	IEAVN701	IEAVTRV	IECVERPL	IEECVET4
IEAVESSE	IEAVN702	IEAVTSAI	IECVERPT	IEECVET6
IEAVESSI	IEAVOUT	IEAVTSBP	IECVESIO	IEECVET7
IEAVESTS	IEAVPCB	IEAVTSCB	IECVEXCP	IEECVET8
IEAVESVC	IEAVPFTF	IEAVTSDC	IECVEXPR	IEECVET9
IEAVESVT	IEAVPIOI	IEAVTSDF	IECVFCHN	IEECVFTA
IEAVETCL	IEAVPIOP	IEAVTSDG	IECVFDEV	IEECVFTB

IEECVFTG	IEEVSTFA	IEFAB4E5	IEFJCNTL	IGFDT0
IEECVFTL	IEEVSTGL	IEFAB4E6	IEFJESDM	IGFDT1
IEECVFTR	IEEVSTGP	IEFAB4E8	IEFJMSFC	IGFDT2
IEECVFT2	IEEVSTOR	IEFAB4FC	IEFJRASP	IGFDV0
IEECVGC1	IEEVSTPE	IEFAB4GB	IEFJRECM	IGFDW0
IEEC2740	IEEVSTRE	IEFAB4I0	IEFJSBLD	IGFINTVL
IEEDISPD	IEEVWAIT	IEFAB4M5	IEFJSDTN	IGFPBUCR
IEEMB808	IEEVWKUP	IEFAB421	IEFJSIMM	IGFPEXIT
IEEMB809	IEEXEDNA	IEFAB422	IEFJSIMW	IGFPKREF
IEEMB810	IEE0003D	IEFAB424	IEFJSINT	IGFPMC1H
IEEMB811	IEE00110	IEFAB425	IEFJSIN2	IGFPMRTM
IEEMB812	IEE0303D	IEFAB428	IEFJSREQ	IGFPMSCA
IEEMB813	IEE0403D	IEFAB429	IEFN903	IGFPMTHA
IEEMB815	IEE0503D	IEFAB430	IEFSD103	IGFPNRFH
IEEMB816	IEE0603D	IEFAB431	IEFSD160	IGFPNSAV
IEEMB820	IEE0703D	IEFAB433	IEFSD161	IGFPSAD0
IEEMB821	IEE0803D	IEFAB434	IEFSD162	IGFPPTCON
IEEMB822	IEE10110	IEFAB435	IEFSD263	IGFPTERM
IEEMB823	IEE20110	IEFAB436	IEFSMFIE	IGFPTRC
IEEMB824	IEE21110	IEFAB438	IEFSMF30	IGFPWMSG
IEEMB825	IEE22110	IEFAB441	IEFSMF32	IGFPXMFA
IEEMB826	IEE2303D	IEFAB451	IEFTB721	IGFRWAC
IEEMB827	IEE23110	IEFAB471	IEFTB722	IGFTMCHK
IEEMB829	IEE24110	IEFAB473	IEFTB724	IGFTMC00
IEEMB830	IEE2903D	IEFAB475	IEFTB726	IGF2503D
IEEMB831	IEE3103D	IEFAB477	IEFTB727	IGF2603D
IEEMB832	IEE3203D	IEFAB478	IEFTB728	IGX00025
IEEMB833	IEE3303D	IEFAB479	IEFUJI	IKJEFP00
IEEMB834	IEE3503D	IEFAB48A	IEFUJV	IKJEFP03
IEEMB835	IEE3603D	IEFAB485	IEFUSI	IKJEFP10
IEEMB836	IEE3703D	IEFAB486	IEFUTL	IKJEFP20
IEEMB837	IEE40110	IEFAB488	IEFU29	IKJEFP60
IEEMB838	IEE4203D	IEFAB489	IEFU83	ILRACT
IEEMB839	IEE4403D	IEFAB49B	IEFU84	ILRASM00
IEEMB842	IEE4603D	IEFAB49C	IEFVEA	ILRASRIM
IEEMB846	IEE4703D	IEFAB490	IEFVHEB	ILRCMP
IEEMB848	IEE4803D	IEFAB491	IEFVHF	ILRCMP01
IEEMB860	IEE4903D	IEFAB492	IEFVHH	ILRCMSRB
IEEMB876	IEE5103D	IEFAB493	IEFVHN	ILRCPBLD
IEEMB880	IEE5403D	IEFAB494	IEFVH1	ILRDRV01
IEEMB881	IEE5603D	IEFAB820	IEFVJA	ILRFMTCV
IEEMB882	IEE5903D	IEFACTRT	IFAEASI	ILRFMTPG
IEEMB883	IEE6303D	IEFATECB	IFAEASIL	ILRFMTSW
IEEMB884	IEE6403D	IEFBB4M3	IFAINIT	ILRFMT00
IEEMPDEV	IEE6503D	IEFBB401	IFARPORT	ILRFRR01
IEEMPDM	IEE6603D	IEFBB404	IFASMFD	ILRFRRSLT
IEEMPS03	IEE6703D	IEFBB410	IFBSVC76	ILRGOS
IEEMPVST	IEE6903D	IEFBB414	IFCDIP00	ILRGOS01
IEEMTEXT	IEE70110	IEFBB416	IFDOLT00	ILRIMMSG
IEEPALTR	IEE7303D	IEFBR14	IFDOLT12	ILRIODRV
IEEPRW12	IEE7503D	IEFDB4A1	IFDOLT30	ILRIOFRR
IEESTPRS	IEE7903D	IEFDB4F8	IFDOLT62	ILRJTERM
IEEVALST	IEE8B03D	IEFDB4F9	IGC0F05A	ILRMSG00
IEEVCPR	IEE8103D	IEFDB400	IGC0001F	ILROPS00
IEEVCPRL	IEE8603D	IEFDB402	IGC0003C	ILRPAGCM
IEEVCPU	IEE90110	IEFDB413	IGC116	ILRPGEXP
IEEVDCCR	IEFAB4A0	IEFDB450	IGE0025C	ILRPOS
IEEVDEV	IEFAB4A2	IEFDB460	IGE0660A	ILRPREAD
IEEVEXSN	IEFAB4A4	IEFENFDM	IGFDE1	ILRQSRIT
IEEVIPL	IEFAB4DD	IEFENFFX	IGFDI0	ILRRLG
IEEVJCL	IEFAB4DE	IEFENFNM	IDGDI1	ILRSVAV
IEEVLWDT	IEFAB4EC	IEFENFWT	IGFDL1	ILRSRBC
IEEVMESS	IEFAB4ED	IEFHB4I1	IGFDMTXT	ILRSRB01
IEEVMNT1	IEFAB4EG	IEFHB4I2	IGFDM0	ILRSWAP
IEEVPTH	IEFAB4E0	IEFHB410	IGFDM1	ILRSWPDR
IEEVSTAR	IEFAB4E2	IEF1B600	IGFDR0	ILRSWP01
IEEVSTEE	IEFAB4E3	IEF1B621	IGFDS0	ILRTERMR
IEEVSTEL	IEFAB4E4	IEF1B660	IGFDS1	ILRTMI00
				ILRTMI01

ILRTMRLG	IRARMIOM	ISGBPG	ISGGDEQP	ISGJENF0
ILRVIOCM	IRARMIPM	ISGBSR	ISGGEST0	ISGJFE
ILRVSAM1	IRARMIPS	ISGBTC	ISGGFRR0	ISGJPARM
IOSVLEVL	IRARMMSG	ISGCDSF	ISGGNQDQ	ISGJRCV
IOSVRSUM	IARAMOPT	ISGCMDI	ISGGQSRV	ISGLNQDQ
IOSVSUCB	IRARMRMR	ISGCMDR	ISGGQWBC	ISGMSG00
IRARMANL	IRARMSET	ISGCPRG	ISGGQWBI	ISGNASIM
IRARMCNS	IRARMSRV	ISGCQMRG	ISGGQWB0	ISGNCBIM
IRARMCPM	IRARMSTM	ISGCQSC	ISGGREX0	ISGNRSP
IRARMCPU	IRARMST2	ISGCRCV	ISGGRNLV	ISGNPGIM
IRARMCTL	IRARMSWP	ISGCRET0	ISGGRNL0	ISGNTASC
IRARMERR	IRARMWAR	ISGCRET1	ISGGRP00	ISGNWMSI
IRARMEVT	IRARMWLM	ISGCRST	ISGGRS00	ISGQSCAN
IRARMEV2	IRARMWLS	ISGDGCB0	ISGGSRV1	ISGQSCNR
IRARMFIP	ISGBCI	ISGDPDMP	ISGGTRM0	ISGSALC
IRARMFMT	ISGBDR	ISGDSDMP	ISGGTRM1	ISGSDAL
IRARMICS	ISGBERCV	ISGDSNAP	ISGGWAIT	ISGSHASH
IRARMINT	ISGBFRCV	ISGDSORT	ISGJDI	ISGSMI
				TESTEXIT

## MVS Macros

ADJTCBQ	IEEBASEA	IHADDR	IHAVRA	PGFREE
AMDSADMP	IEECDM	IHADQE	IHAVSL	PGFREEA
AMDSADM2	IEECHAIN	IHADSAB	IHAWPRB	POST
ATSET	IEECRDCM	IHAETD	IHAWQE	PROTPSA
AXEXT	IEECSUB	IHAFBQE	IHAWSAVT	PT
AXFRE	IEECUCM	IHAFRRS	IHAXSB	RESUME
AXRES	IEESMCA	IHAHSA	IHERMAC	RPSGNL
AXSET	IEEXSA	IHALCCA	IHBINNRX	RRBE
CALLDISP	IEFAJCTB	IHALDA	IHBPSINR	SAC
CALLRTM	IEFALLCT	IHALRB	IHLMGTRC	SCHEDULE
CLN1126A	IEFASCTB	IHAMBCB	IKJIDENT	SDUMP
CLN1126B	IEFJESCT	IHAMPL	IKJOPER	SETFRR
CLN1226A	IEFJMR	IHANSSA	IKJPOSIT	SETLOCK
CLN1326A	IEFJSBVT	IHAORE	IKJRB	SETRP
CVT	IEFJSCVT	IHAOUSB	IKJTCTB	SGAHL400
DELETE	IEFJSIPL	IHAOUXB	IKJTERM	SGAMA401
EPAR	IEFJSSIB	IHAPCBR	ILRASMHD	SGAMA501
ESAR	IEFNEL	IHAPGTE	IMDMEDIT	SGFDSP04
ESTAE	IEFSSCU	IHAPQE	INTSECT	SGICP400
ETCON	IEFSSSET	IHAPSA	IOSGEN	SGIDSP04
ETCRE	IEFSSSM	IHAPVT	IOSLEVEL	SGIEA2D1
ETDES	IEFSSVR	IHAQVOD	IRAOUCH	SGIEA2D2
ETDIS	IEFSSVS	IHAQVPL	ISGGREXS	SGIEA200
EWAMAP	IEFTCT	IHARB	ISGGRNLS	SGIEA201
GQSCAN	IEFUCBOB	IHARMPL	ISGPEL	SGIEA202
IAC	IEFZB431	IHARSMHD	ISGRIB	SGIEA300
IEAIPL00	IEZCOM	IHASCB	ISGRNLE	SGIEA4D1
IEAIPS00	IEZEACOD	IHASCVT	ISKE	SGIEA4D2
IEAOPT00	IEZEAECB	IHASDUMP	IVSK	SGIEA400
IEAPAKBA	IEZEATTR	IHASDWA	LASP	SGIEA401
IEAPAKBV	IEZMGCR	IHASDWRK	LINK	SGIEA402
IEAPAKTS	IEZPIPL	IHASGTE	LOAD	SGIEA502
IEAPAKTV	IEZPRULE	IHASMDLR	LOCASCB	SGIEA600
IEAMP	IFASMFR	IHASMWK	LXFRE	SGIEC202
IEAVBK	IFASMFR4	IHASNAP	LXRES	SGIEC300
IECDDT	IFASMFR1	IHASRB	MODESET	SGIEE0MS
IECDIOCM	IFASMFR2	IHASSAT	MODID	SGIEF0PT
IECDIOSB	IFASMFR3	IHASTKH	MVCK	SGIEF214
IECDLMSG	IHAASCB	IHASU50	MVCP	SGIEF300
IECDRQE	IHAASTE	IHASU65	MVCS	SGIEF440
IECDXCPS	IHAASVT	IHASU74	OPERATOR	SGIEF441
IECICS	IHAASXB	IHASVT	PC	SGIFA600
IECVNUCB	IHACDE	IHATRBPL	PCLINK	SGIFB600
IECVUCB	IHACMS	IHATREPL	PGANY	SGIGF401
IECXTCB	IHACTM	IHAVFPM	PGFIXA	SGILR300

SGISG300	SMFEXIT	SNAP	SYNCH	UCL1226A
SGISG400	SMFFRMT	SRBSTAT	SYSEVENT	UCL1226B
SGISG401	SMFINTVL	SRBTIMER	TEXTEXIT	UCL1326A
SGISG402	SMFPRM00	SSAFF	TESTPROT	VRADATA
SMFCHSUB	SMFRTEST	SSAR	TSEVENT	WINDOW
SMFDETAL	SMFSUBP	SSKE	UCL1126A	XCTL
SMFEWTM	SMFTSOCM	STATUS	UCL1126B	

### JES3 Modules and Macros

For MVS/System Product Release 3 the entire JES3 product was shipped. Listed here are only the new MVS/SP Release 3 JES3 modules and macros.

### JES3 Modules

IATCNNJ	IATINN2	IATNTCP	IATNTSD	IATSIAD
IATCN78	IATINN3	IATNTDP	IATNTSF	IATSICC
IATDMIT	IATINN4	IATNTDR	IATNTSR	IATSIOR
IATDMUB	IATINXM	IATNTDT	IATODNJ	IATSSRE
IATDMXM	IATIQNJ	IATNTFD	IATOSNJ	IATSSRN
IATINTT	IATISNJ	IATNTLG	IATOSNT	IATSSXM
IATINNI	IATMONJ	IATNTRT	IATOSSC	IATUX33
				IATUX34

### JES3 Macros

IATXJBTS	IATXTATS	IATYNCQ	IATYNJH	IATYPCD
IATXMGET	IATYDMC	IATYNCT	IATYNJT	IATYSPB
IATXMTCK	IATYDSS	IATYNDH	IATYNJY	IATYSPC
IATXMVXM	IATYMTC	IATYNLP	IATYNLG	IATYSSCX
IATXPGXM	IATYNBF	IATYNDT	IATYNOD	IATYSSXE
IATXSPCK	IATYNCM	IATYNFD	IATYNRG	IATYUCN
IATXSSXM	IATYNCN	IATYNFR	IATYNRQ	SGIAT5JM
IATXSTTA	IATYNCP	IATYNIS	IATYNISM	SGIAT5LL

### JES2 Modules

HASPBSC	HASPDOG	HASPNUC	HASPSNA	HASPWARM
HASPCCKPT	HASPINIT	HASPPRPU	HASPSSSM	HASPXEQ
HASPCOMM	HASPMISC	HASPRDR	HASPSTAM	
HASPCON	HASPNET	HASPRTAM	HASPTERM	

### JES2 Macros

\$\$POST	\$\$ASVT	\$\$CNVWORK	\$\$DORMANT	\$\$FRELOCK
\$\$WTO	\$\$ATB	\$\$COM	\$\$DSAB	\$\$FREMAIN
\$\$WTOR	\$\$BADTG	\$\$COMWORK	\$\$DUMP	\$\$FREUNIT
\$\$ADD	\$\$BASEA	\$\$COUNT	\$\$DVA	\$\$GETBUF
\$\$BLD	\$\$BFRBLD	\$\$CPT	\$\$DYN	\$\$GETCEL
\$\$CAN	\$\$BFW	\$\$CSA	\$\$ENTRY	\$\$GETCMB
\$\$GET	\$\$BIND	\$\$CSCB	\$\$ERA	\$\$GETLOK
\$\$JCT	\$\$BLDTGB	\$\$CVT	\$\$ERPL	\$\$GETMAIN
\$\$JOE	\$\$BPM	\$\$CWTO	\$\$ERROR	\$\$GETSMFB
\$\$MOD	\$\$BUFFER	\$\$DCB	\$\$ESTAE	\$\$GETUNIT
\$\$PDBCAN	\$\$CAT	\$\$DCT	\$\$SEWA	\$\$GETWORK
\$\$PUT	\$\$CCA	\$\$DEB	\$\$EXCP	\$\$HASPGEN
\$\$REM	\$\$CCE	\$\$DECODE	\$\$EXIT	\$\$HCT
\$\$ACB	\$\$CCW	\$\$DECOD1	\$\$EXITPL	\$\$HCTENT
\$\$ACBXL	\$\$CDE	\$\$DEST	\$\$EXTP	\$\$ICE
\$\$ACT	\$\$CHEK	\$\$DISTERR	\$\$FIND	\$\$IOCM
\$\$ACTIVE	\$\$CK	\$\$DELENGTH	\$\$FMH	\$\$IOERROR
\$\$ALLOC	\$\$CKPT	\$\$DMQWORK	\$\$FRECEL	\$\$IOSB
\$\$APT	\$\$CKPWORK	\$\$DOE	\$\$FRECEMB	\$\$IOT
\$\$ASCB	\$\$CMB	\$\$DOM	\$\$FREEBUF	\$\$JCAN

\$JCT	\$NETACCT	\$PSA	\$RQE	\$TEXT
\$JESCT	\$NH	\$PSCB	\$RTAMDEF	\$TGB
\$JESERR	\$NIB	\$PSO	\$SAVE	\$TGM
\$JFCB	\$NIT	\$PSOWORK	\$SCAT	\$TIME
\$JOE	\$NJTWORK	\$PURGE	\$SCR	\$TIOT
\$JOT	\$NMR	\$QADD	\$SDB	\$TITLE
\$JQE	\$NPEXIT	\$QGET	\$SDWA	\$TLGWORK
\$JSCB	\$NPMWORK	\$QJIX	\$SEPPDIR	\$TQE
\$KEYS	\$NSP	\$QLOC	\$SETPRT	\$TRACE
\$KIT	\$NSRWORK	\$QMOD	\$SETRP	\$TRACK
\$LCCA	\$NSTWORK	\$QPUT	\$SIOT	\$TTE
\$LCT	\$OCR	\$QREM	\$SJB	\$TTIMER
\$LGRR	\$OCT	\$QSE	\$SMCA	\$UCB
\$LINE	\$ORE	\$QSUSE	\$SMF	\$UCM
\$LINK	\$OUTWORK	\$QUESMBF	\$SPL	\$VFL
\$LMT	\$PAGE	\$RAT	\$SRB	\$WAIT
\$LRC	\$PATCHSP	\$RB	\$SSCT	\$WARMWRK
\$MCODE	\$PBLOCK	\$RCPWORK	\$SSIB	\$WORK
\$MID	\$PCE	\$RDRWORK	\$SSOB	\$WPL
\$MIT	\$PCIE	\$RDT	\$STIMER	\$WQE
\$MITETBL	\$PDDB	\$REGS	\$STORE	\$WTO
\$MLMWORK	\$PGSRCV	\$RELEASE	\$SVT	\$XCTL
\$MODEND	\$PIT	\$RESERVE	\$SVTC	\$XFMWORK
\$MODMAP	\$POST	\$RESTORE	\$SYSPARM	\$XIT
\$MODULE	\$PPPWORK	\$RETSAVE	\$TAB	\$XMPOST
\$MSG	\$PQE	\$RETURN	\$TCB	\$XRT
\$NAT	\$PQH	\$RETWORK	\$TCT	\$XTLST
\$NCC	\$PRE	\$RMR	\$TED	
\$NEL	\$PRPUT	\$RPL	\$TEST	

## MVS/SP Release 3.1

This section lists new and changed modules and macros shipped for MVS/SP Release 3.1.

### MVS Modules

AMDSADER	ICPCIOCU	IEE0803D	ILRASRIM	ILRMSG00
AMDSASIO	ICPCIODV	IEE1403D	ILRASTBL	ILROPS00
AMDSATXT	ICPCMSG	IEE3203D	ILRCMP	ILRPGEXP
AMDSAUCB	ICPCPUT	IEE3503D	ILRCPBLD	ILRPREAD
ICPCARDS	ICPCRDDS	IEFDB412	ILRFMT00	ILRQSRIT
ICPCARDX	ICPCRPT	IEFDB414	ILRFMTPG	ILRSWAP
ICPCGET	ICPCRTNS	IEFVDA	ILRFMTSW	ILRSWPDR
ICPCGNDS	ICPCWTDS	IEFVFA	ILRFRR01	ILRTMI00
ICPCINIT	ICPPCNTL	IEFVGM	ILRIMMSG	
ICPCIOCP	IEAVNP02	IEFVGM71	ILRIODRV	

### MVS Macros

CPYRIGHT	IEFCOMWA	ILRCACHE	ILRSART	SGICP400
CVT	IEFZB4D2	ILRDVTAB	ILRSAT	SGIEC202
EDTGEN	IEFZB4D3	ILRPART	ILRSCCW	SGIEF212
IECVNUCB	IEFZB4D4	ILRPCCW	ILRSCT	SGIEF216
IEECUCM	ILRASMVT	ILRPCT	ILRTPARB	SGILR400
				SMFPRM00

## JES3 Modules and Macros

For MVS/System Product Release 3.1 the entire product was shipped. Listed here are only the new MVS/SP Release 3.1 JES3 modules and macros.

### JES3 Modules

IATABIP	IATINCF	IATMDOP	IATUX35	IATUX40
IATABRT	IATINCH	IATMOMT	IATUX36	IATUX41
IATATCB	IATIQMT	IATMSDR	IATUX37	IATUX42
IATAUX	IATMDDD	IATNTJS	IATUX38	IATUX43
IATGRSR	IATMDDT	IATSIEM	IATUX39	

### JES3 Macros

IATXATDE	IATYATCB	IATYPID	IATYVCK
IATXJLOK	IATYATDE		IATYVTS
IATXLPJ3			
IATXSTMD			
IATXTEST			

## MVS/SP Release 3.2

This section lists new and changed modules and macros shipped for MVS/SP Release 3.2.

### MVS Modules

AMDPRGCD	IEECB808	IEE8B03D	IEFIB645	IEFSJJDV
AMDPRLRF	IEECB811	IEE8103D	IEFJDT01	IEFSJPUT
AMDPRMST	IEECB866	IEFAB4A0	IEFJDT02	IEFSJRET
AMDSAAUD	IEECB900	IEFAB4ED	IEFJDT03	IEFSJUPD
AMDSACON	IEECB901	IEFAB421	IEFJDT04	IEFSJWRT
AMDSAGSM	IEECVETA	IEFAB430	IEFJESDM	IEFVDA
AMDSAIOI	IEECVETC	IEFAB434	IEFJJOBS	IEFVEA
AMDSAPRO	IEECVETF	IEFAB436	IEFJMSFC	IEFVFA
AMDSARSM	IEEMB860	IEFAB471	IEFJSBLD	IEFVGK
AMDSASIN	IEEVWAIT	IEFAB475	IEFJSIMM	IEFVGM
AMDSATER	IEEXEDNA	IEFAB477	IEFJSINT	IEFVGM6
IEASYSID	IEE0503D	IEFAB485	IEFJSVEC	IEFVGM70
IEAVG700	IEE10110	IEFAB490	IEFN9CR	IEFVGM72
IEAVH600	IEE3103D	IEFAB492	IEFN9IR	IEFVHA
IEAVMDSV	IEE3603D	IEFAB493	IEFN903	IEFVHCB
IEAVMWSV	IEE3703D	IEFBB416	IEFQB550	IEFVHE
IEAVMWTO	IEE4303D	IEFDB4A1	IEFQB555	IEFVHEB
IEAVNIPM	IEE4703D	IEFDB4F0	IEFSD161	IEFVHF
IEAVNIP0	IEE5603D	IEFDB400	IEFSJBLD	IEFVHN
IEAVNP03	IEE5903D	IEFDB410	IEFSJCNL	IEFVH1
IEAVNP13	IEE6303D	IEFDB412	IEFSJDEF	IEFVJDTI
IEAVTSDM	IEE6703D	IEFDB413	IEFSJDEL	IEFVJDTV
IEAVVINT	IEE7503D	IEFDB414	IEFSJEXT	IEFXB500
IEAVVWTO	IEE7803D	IEFDB417	IEFSJFND	IEFXB601
IEAVXDOM	IEE7903D	IEFDB418	IEFSJGET	IEFXB611
IEECB806	IEE8A03D	IEFIB600	IEFSJINT	ILRQSRIT

## MVS Macros

AMDSADM2	IEFJDESB	IEFSJDLP	IEFSWB	IEFZB507
AMDSARMK	IEFJDKEY	IEFSJEXP	IEFTXTFT	IEFZB601
CPYRIGHT	IEFJDMAC	IEFSJFFM	IEFUCBOB	IEFZB611
CVT	IEFJDPRM	IEFSJFGM	IEFVKEYS	IEFZB9RD
GETSTORG	IEFJDSCN	IEFSJFNP	IEFVMAWA	IEZVG100
IEAPPNIP	IEFJDSUB	IEFSJGEP	IEFVMIWA	IHAPSA
IECDDT	IEFJDT	IEFSJINP	IEFVMMWA	IHAWQE
IEECDM	IEFJDVRB	IEFSJJD	IEFVMSWA	ILRSCT
IEECUCM	IEFJDVT	IEFSJPF	IEFVTSPL	SGAMA401
IEETDCM	IEFJESCT	IEFSJPUP	IEFZB4DA	SGAMA501
IEEZB807	IEFJFCBN	IEFSJRC	IEFZB4DC	SGICP400
IEEZB810	IEFJMR	IEFSJREP	IEFZB4DD	SGIEA400
IEFASCTB	IEFJSBVT	IEFSJREQ	IEFZB4D2	SGIEC202
IEFASIOT	IEFJSCVT	IEFSJRUP	IEFZB4D3	SGIEE0MS
IEFCIFP	IEFNEL	IEFSJWRP	IEFZB4D4	SGIEF2SS
IEFCOMWA	IEFSJBLP	IEFSSCM	IEFZB4D7	SGIEF212
IEFCVRWA	IEFSJCNP	IEFSSDA	IEFZB4D9	SGIEF440
IEFJCTX	IEFSJCNW	IEFSSJS	IEFZB453	SGIEF441
IEFJDEND	IEFSJDFP	IEFSSWT	IEFZB504	

## MVS/SP Release 3.3

This section lists new and changed modules and macros shipped for MVS/SP Release 3.3.

## MVS Modules

AMDPRFMT	IEECB811	IEFAB4A2	IEFDB400	IEFSVMSG
AMDSAPGE	IEECB862	IEFAB4A4	IEFDB411	IEFUCBOB
AMDSAPRO	IEECB904	IEFAB4EI	IEFDB412	IEFVDA
IEASYSID	IEEMB877	IEFAB4E0	IEFDB413	IEFVFA
IEAVH600	IEEMTEXT	IEFAB4E5	IEFDB414	IEFVGM
IEAVMDSV	IEESB605	IEFAB4F9	IEFJDT02	IEFVGM72
IEAVMWSV	IEEVCPR	IEFAB4M5	IEFJDT03	IEFVHA
IEAVMWTO	IEEVPTH	IEFAB4SF	IEFJMSFC	IEFVHCB
IEAVNIPM	IEEVSMG	IEFAB421	IEFJSBLD	IEFVHE
IEAVNIP0	IEEVSTAR	IEFAB429	IEFJSDTN	IEFVHI
IEAVNPM3	IEE21110	IEFAB434	IEFJSWT	IEFVJDTI
IEAVNP02	IEE2303D	IEFAB436	IEFSD161	IFBSVC76
IECIOSAM	IEE3103D	IEFAB464	IEFSJBLD	IGC00051
IECVBRV	IEE3303D	IEFAB473	IEFSJCNL	IGC05051
IECVDPTH	IEE3603D	IEFAB488	IEFSJDEF	IGE0660A
IECVFDEV	IEE4203D	IEFAB49A	IEFSJDEL	IGFDT1
IECVGENA	IEE4403D	IEFAB490	IEFSJEXT	IGFDT2
IECVHREC	IEE4603D	IEFAB492	IEFSJGET	IGFDV0
IECVIOPM	IEE4803D	IEFAB494	IEFSJINT	ILRASRIM
IECVIOSI	IEE4903D	IEFAB495	IEFSJJDV	ILRCMP
IECVOTBL	IEE5903D	IEFABUSF	IEFSJPUT	ILRCPBLD
IECVRRSV	IEE6703D	IEFAUIN	IEFSJRET	ILRIMMSG
IECVRSTI	IEE7303D	IEFAUSD	IEFSJUPD	ILRIODRV
IEECB809	IEE7503D	IEFAUSRV	IEFSJWTR	ILROPS00
				ILRPGEXP
				ILRPREAD



## MVS Macros

CPYRIGHT	IECDIOSB	IEFAUSRQ	IEFSJRUP	IFBSVC76
CVT	IECDIPIB	IEFCIFP	IEFSSAL	IFDEVTAB
IAZCHK	IECDRESV	IEFJDESB	IEFSSVS	IGFDDE
IAZFSCT	IECVNUCB	IEFJDKEY	IEFUCBOB	IGFDDPRM
IAZFSIP	IEECHAIN	IEFJDPRM	IGFVMIWA	IOSGEN
IAZFSREQ	IEECUCM	IEFJDSUB	IEFZB4DA	SGAMA501
IAZFSVT	IEEVMPRM	IEFJDT	IEFZB4DC	SGIEA300
IAZIDX	IEEZB812	IEFJFCBN	IEFZB4DD	SGIEC202
IAZJSPA	IEFASIOT	IEFNEL	IEFZB4D2	SGIEF0PT
IAZRESPA	IEFAUIPM	IEFSJCNW	IEFZB431	SGIEF300
IEAVBK	IEFAUSCB	IEFSJPFX	IEZCIB	SGIEF440
IEAVVWTO	IEFAUSPM	IEFSJRC	IFASMFR2	SGIEF441
				SMFPRM00

## JES2 Modules and Macros

For MVS/System Product Release 3.3 the entire JES2 product was shipped. Listed here are only the new and changed MVS/SP Release 3.3 JES2 modules and macros.

## JES2 Modules

HASPAM	HASPD0C	HASPIRA	HASPNET	HASPSNA
HASPBLKS	HASPFMT0	HASPIRDA	HASPNUC	HASPSPOL
HASPBCS	HASPFMT1	HASPIRMA	HASPPRPU	HASPSSSM
HASPCKPT	HASPFMT2	HASPIRPL	HASPRDR	HASPSTAM
HASPCNVT	HASPFMT3	HASPIRRE	HASPRTAM	HASPTABS
HASPCOMM	HASPFMT4	HASPJOS	HASPCAN	HASPTERM
HASPCON	HASPFMT5	HASPMISC	HASPSERV	HASPWARM
				HASPXEQ

## JES2 Macros

\$\$POST	\$BUFCCK	\$DCT	\$FREQC	\$JCAN
\$\$WTO	\$BUFFER	\$DCTTAB	\$FREUCBS	\$JCT
\$\$WTOR	\$BUFIO	\$DECODE	\$FREUNIT	\$JCTIO
##ADD	\$CALL	\$DEST	\$FSACB	\$JFL
##ALCHK	\$CAT	\$DISTERR	\$FSAXB	\$JFW
##BLD	\$CB	\$DMQWORK	\$FSILINK	\$JIB
##CAN	\$CCA	\$DOE	\$FSSCB	\$JOE
##CHK	\$CCE	\$DOM	\$FSSWORK	\$JOT
##GET	\$CCW	\$DORMANT	\$FSSXB	\$JQE
##JCT	\$CFCVE	\$DUMP	\$GCB	\$KEYLIST
##JOE	\$CFDCTD	\$DTE	\$GETABLE	\$KIT
##MOD	\$CFEDTR	\$DVA	\$GETASCB	\$LCK
##PDBCAN	\$CFPRSCN	\$ENTRY	\$GETBLK	\$LGRR
##PDBLOC	\$CFRTC	\$EPILOG	\$GETBUF	\$LINE
##POST	\$CFWSCAN	\$ERA	\$GETCEL	\$LMT
##PUT	\$CHEK	\$ERPL	\$GETCMB	\$LRC
##REM	\$CHK	\$ERROR	\$GETL0K	\$MAIN
\$ACT	\$CIRWORK	\$EST	\$GETMAIN	\$MCODE
\$ACTIVE	\$CK	\$ESTAE	\$GETQC	\$MCT
\$ALLOC	\$CKPT	\$EXCP	\$GETSMFB	\$MID
\$APT	\$CKPWORK	\$EXIT	\$GETUCBS	\$MIT
\$BADTG	\$CMB	\$EXITPL	\$GETUNIT	\$MITETBL
\$BFD	\$CNVWORK	\$EXTP	\$GETWORK	\$MLMWORK
\$BFRBLD	\$COM	\$FIND	\$HASPEQU	\$MODEND
\$BFW	\$COMWORK	\$FMH	\$HASPGBL	\$MODMAP
\$BIND	\$COUNT	\$FRECEL	\$HCT	\$MODULE
\$BLDQC	\$CPT	\$FRECEMB	\$HFCT	\$MSG
\$BLDTGB	\$CSA	\$FREEBUF	\$ICE	\$NAT
\$BPM	\$CWTO	\$FRELOK	\$IOERROR	\$NCC
\$BTG	\$DAS	\$FREMAIN	\$IOT	\$NETACCT

\$NHD	\$POST	\$QSUSE	\$SCR	\$TGM
\$NIT	\$PPPWORK	\$QUESMFB	\$SDB	\$TIDTAB
\$NJTWORK	\$PQE	\$RAT	\$SDUMP	\$TITLE
\$NMR	\$PQH	\$RCPWORK	\$SEPPDIR	\$TLGWORK
\$NPEXIT	\$PRE	\$RDRWORK	\$SETPRT	\$TQE
\$NPMWORK	\$PRMD	\$RDT	\$SETRP	\$TRACE
\$NSP	\$PROLOG	\$REGS	\$SJB	\$TRACK
\$NSRWORK	\$PRPUT	\$RELEASE	\$SJXB	\$TRP
\$NSTWORK	\$PSO	\$RESERVE	\$SMF	\$TTE
\$OCR	\$PSOWORK	\$RESTORE	\$SPL	\$TTIMER
\$OCT	\$PURGE	\$RETBK	\$SPMWORK	\$UPL
\$OUTWORK	\$QADD	\$RETSAVE	\$STIMER	\$VFL
\$PAGE	\$QCT	\$RETURN	\$STMTLOG	\$WAIT
\$PATCHSP	\$QCTGEN	\$RETNWK	\$STORE	\$SWARMWRK
\$PBLOCK	\$QGET	\$RWL	\$SVOLOC	\$WORK
\$PCE	\$QJIX	\$SAVE	\$SVT	\$WSCTABL
\$PCETAB	\$QLOC	\$SCAN	\$SVTC	\$WTO
\$PCIE	\$QMOD	\$SCANB	\$SWBIT	\$XECB
\$PDDB	\$QPUT	\$SCANTAB	\$TAB	\$XEQWORK
\$PGSRVC	\$QREM	\$SCANWA	\$TEST	\$XFMWORK
\$PIT	\$QSE	\$SCAT	\$TGB	\$XIT
				\$XMPOST
				\$XRT

## MVS/SP Release 3.4

### JES3 Modules and Macros

Listed here are the new and changed MVS/SP Release 3.4 JES3 Modules and Macros.

#### *JES3 Split Modules*

<u>Module Name</u>	<u>Split Into</u>	
IATGRJS	IATGRJS	IATIIPS
	IATIICS	IATINJS
IATGRWJ	IATGRWJ	IATGRWM
IATIHDR	IATIHDR	IATIIPN
	IATIIMS	
IATIIP3	IATIIP3	IATIJT
IATINAT	IATINAT	IATINAX
IATINII	IATINII	IATINIP
	IATINIF	
IATINGL	IATINGL	IATINGS
IATINGN	IATINGN	IATINVR
	IATINRB	
IATINM1	IATINCL	IATINMP
	IATINGP	IATINSL
	IATINMI	
IATOSDR	IATOSDR	IATOSDO
IATOSMP	IATOSMP	IATOSMI
IATOSWD	IATOSWD	IATOSWC

### *JES3 New Modules*

IATABFS	IATIIJT	IATOSFI
IATBDCI	IATIIIMS	IATOSFM
IATDJCR	IATIIOR	IATOSFP
IATDJTR	IATIIOS	IATOSFR
IATDMBS	IATIIPC	IATOSFS
IATDMST	IATIIPN	IATOSFT
IATDMTA	IATIIPS	IATOSMI
IATDMVR	IATIIPW	IATOSRS
IATFCLT	IATIIUN	IATOSWC
IATFCMS	IATINAX	IATSIBD
IATFCOR	IATINCL	IATSICD
IATFCPT	IATINFA	IATUTIS
IATFCSN	IATINFC	IATUTSM
IATFCTR	IATINFS	IATUX44
IATFPCC	IATINGP	IATUX45
IATFPCC	IATINGS	IATUX46
IATFPCC	IATINIF	IATUX47
IATFPDD	IATINIP	IATUX49
IATFPGD	IATINI1	IATUX50
IATFPGF	IATINJQ	IATUX56
IATFPQC	IATINJR	
IATFPRA	IATINJS	
IATFPRD	IATINMP	
IATFPSB	IATINRB	
IATGRCK	IATINSD	
IATGRFS	IATINSL	
IATGRPTF	IATINSP	
IATGRUX	IATINSR	
IATGRVTF	IATINST	
IATGRWM	IATINVR	
IATIID	IATIQFS	
IATIIJ	IATIQFG	
IATIICS	IATIQPR	
IATIIIDA	IATIQSP	
IATIIIDS	IATMOFS	
IATIIFC	IATMOSP	
IATIIFO	IATODFD	
IATIIFP	IATOSDO	
IATIIFR	IATOSFD	
IATIIFS	IATOSFG	

***JES3 New Macros***

IATXAMDV	IATYFSA	IATYTGB
IATXBKIO	IATYFSBX	IATYUSVT
IATXCIO	IATYFSCB	IATYUTI
IATXCKPT	IATYFSDB	IATYXOID
IATXFRQ	IATYFSS	IATYXTR
IATXFSS	IATYFVP	IATYVRY
IATXGFM	IATYHTX	IATZHEX
IATXLP	IATYICP	IATZPARM
IATXPDQ	IATYIDA	IATZUT00
IATXPHEX	IATYIFC	IATZUT01
IATXPRES	IATYIFD	IATZUT02
IATXPTCK	IATYINPX	IATZUT03
IATXSAS	IATYIPW	IATZUT04
IATXSCH	IATYJDO	IATZUT05
IATYABL	IATYJDSO	IATZUT06
IATYBCNS	IATYJTS	IATZUT07
IATYBFPX	IATYMWTO	IATZUT08
IATYBLK	IATYNSh	IATZUT09
IATYBSCT	IATYNWR	IATZUT10
IATYBSID	IATYOSA	IATZUT11
IATYBSIW	IATYOSR	IATZUT12
IATYBTC	IATYPDB	IATZUT13
IATYBTR	IATYPDQ	IATZUT14
IATYCCB	IATYPTC	IATZUT15
IATYCFT	IATYPTX	IATZUT16
IATYCTX	IATYQCP	IATZUT17
IATYDFB	IATYRQC	IATZUT18
IATYDJF	IATYRRE	IATZUT19
IATYDJR	IATYSCTB	IATZUT20
IATYDJT	IATYSPR	IATZUT21
IATYEIE	IATYSRL	IATZUT22
IATYFCK	IATYS99	IPURGE
IATYFRC	IATYTAW	

***Rewritten and Renamed Modules/Macros***

<u>Old Module</u>	<u>Modules which incorporate functions of the old module</u>	
IATINCK	IATGRCK	IATINIO
	IATINSD	IATINSP
	IATINSR	
IATINJC	IATINJQ	
IATINRS	IATINJR	IATINST
IATINRT	IATINJQ	IATINJR
	IATINST	
IATINTT	IATDMVR	IATINSD
	IATINSP	IATINST
IATYTQE	IATYRRE	

## JES2 Modules and Macros

Listed here are the new and changed MVS/SP Release 3.4 JES2 modules and macros.

### JES2 Modules

HASPAM	HASPFMT3	HASPIRMA	HASPPRPU	HASPSSSM
HASPASC	HASPFMT4	HASPIRPL	HASPRDR	HASPSTAM
HASPCKPT	HASPFMT5	HASPIRRE	HASPRTAM	HASPTABS
HASPCOMM	HASPFSSM	HASPJOS	HASPSCAN	HASPTERM
HASPDCC	HASPFSSP	HASPMISC	HASPSERV	HASPWARM
HASPFMT1	HASPIRA	HASPNET	HASPSNA	HASPXEQ
HASPFMT2	HASPIRDA	HASPNUC	HASPSPOL	

### JES2 Macros

SBFD	SFSIEQU	SHASPGBL	\$MIT	\$PPPWORK
SCIRWORK	\$FSSCB	\$HCT	\$MODMAP	\$RAT
\$COMWORK	\$FSSWORK	\$HFCT	\$MODULE	\$SETPRT
\$DCT	\$FSSXB	\$JIB	\$NSRWORK	\$SVT
\$DCTTAB	\$GCB	\$LRC	\$NSTWORK	\$TIDTAB
SEXIT	\$GETABLE	\$LRCBLD	\$PCE	\$VFL
\$FSACB	\$GETWORK	\$LRCGET	\$PCEDYN	\$WORK
\$FSAXB	\$HASPEQU	\$MCT	\$PCETAB	

## MVS/SP Release 3.5

This section lists new and changed modules and macros shipped for MVS/SP Release 3.5.

### MVS Modules

AMDDASCB	AMDSATER	IEAVERI	IEECLEAN	IEFSD263
AMDDCSD	AMDSATXT	IEAVESC0	IEEMB887	IEFXB500
AMDDCVT	AMDSAT80	IEAVESPR	IEEMCHPI	IEFSMFIE
AMDDLCCA	AMDSAUCB	IEAVESRT	IEEMCHSI	IEFTB726
AMDDPCCA	AMDSAWAT	IEAVESTS	IEEMCPUI	IEFTB728
AMDDPSA1	BLSVASCB	IEAVESVC	IEEMMRSP	IEFXB601
AMDDSVT	BLSVCSD	IEAVESVT	IEEMMSAI	IFAEASI
AMDPRFCB	BLSVLCCA	IEAVETCL	IEEMMVSL	IGFCCHCR
AMDPRLRF	BLSVTCB	IEAVEVRR	IEEMPDM	IGFCIC
AMDSAASM	IEASYSID	IEAVFRMD	IEEMPDMM	IGFPMSCA
AMDSAAUD	IEAVBK	IEAVGM00	IEEMSPCS	IHAPFTE
AMDSABUF	IEAVEAT0	IEAVGM03	IEEMSTEI	IHAPVT
AMDSACON	IEAVEBBR	IEAVINV	IEEMSTRI	IHARCFPL
AMDSACPU	IEAVEDS0	IEAVMSF	IEEMTEXT	IHARCA
AMDSADER	IEAVEDSR	IEAVMSFN	IEEPARSE	IKJTCB
AMDSAEXI	IEAVEED0	IEAVNIP0	IEEVCPRL	IRARMCNS
AMDSAGSM	IEAVEEE2	IEAVNPM2	IEEVCPR	IRARMCPM
AMDSAIDD	IEAVEEXT	IEAVNP03	IEEVCPU	IRARMCPU
AMDSAI0I	IEAVEINT	IEAVNP10	IEEVLDTW	IRARMCTL
AMDSALDR	IEAVEIO	IEAVNPX1	IEEVSTEL	IRARMEVT
AMDSALSR	IEAVEJST	IEAVRCF	IEEVSTFA	IRARMFIP
AMDSAMCI	IEAVELCR	IEAVRTI0	IEEVSTGL	IRARMFRR
AMDSAPGE	IEAVELK	IEAVRTI1	IEEVSTGP	IRARMINT
AMDSAPGI	IEAVELKR	IEAVRTOD	IEEVSTOP	IRARMIOM
AMDSAPRO	IEAVEMDL	IEAVSY50	IEEVSTPE	IRARMOPT
AMDSAPRT	IEAVEMIN	IEAVTACR	IEEVWKUP	IRARMRWR
AMDSARDM	IEAVEMRQ	IEAVTMT	IEEZB815	IRARMSET
AMDSASIO	IEAVEMSO	IEAVTRET	IEFSD161	IRARMSRV
AMDSASVI	IEAVEOR	IEAVTRTH	IEFSD162	IRARMSTM
AMDSATAP	IEAVEREX	IEAVTSIN	IEFSD164	IRARMST2

IRARMSWP	IRARMWLS	ISGGQWBI	ISGGRS00	ISGNCBIM
IRARMWAR	ISGBSR	ISGGRNLV	ISGJPARM	ISGNPARS
IRARMWLM	ISGGNQDQ	ISGGRNL0	ISGNASIM	ISGNRNLP

**MVS Macros**

AMDSADMP	IHACSD	IRARCT	ISGRNLE	SGAMA401
AMDSADM2	IHALCCA	IRARMCT	ISGRNLMS	SGIEA300
GRSRNL00	IHALRB	ISGDPL	ISGRNLPR	SGIEA401
IEAIPL00	IHAPCCA	ISGGVT	ISGRPT	SGIEA600
IEAPPNIP	IHAPSA	ISGPARS	ISGRSH	SGISG300
IEAPXNIP	IHASCCB	ISGPEL	ISGRSL	SGISG402
IEFALLCT	INTSECT	ISGQCB	ISGRSV	SMFFRMT
IEFJCTX	IRACCT	ISGQEL	ISGSUPL	SMFMERGE
IEFTCT	IRAMCT	ISGQWA	SCHEDULE	
IFASMFR	IRAOLST	ISGRNLCK	SETFRR	

## Chapter 4. Publications/Microfiche Ordering Information

This chapter lists the publications and microfiche that have been updated for each release of the MVS/System Product (MVS/SP). You can use this information to ensure that you have all the publications and microfiche associated with the specific release of MVS/SP installed at your location.

### Using the Order Lists

This chapter contains for each release of MVS/SP, a list of the books and microfiche that have been updated for that release. Figure 4-1 shows the format of these lists.

Title <sup>1</sup>	Order Numbers <sup>2</sup>		
	Base <sup>3</sup>	Prerequisite <sup>4</sup>	Release 3.3 <sup>5</sup>
OS/VS2 MVS System Logic Library Volume 7	LY28-1083-0	LN28-5025	LD23-0290-0
Operator's Library: OS/VS2 System Commands	*****	None	GC28-1031-2
OS/VS2 SPL: TSO	GC28-0629-3	GN28-2971 GD23-0227-0	None

Figure 4-1. Example of an MVS/SP Publications/Microfiche List

The list identifies the updated publications and microfiche by:

<sup>1</sup> title

<sup>2</sup> all the pertinent order numbers for this title for this MVS/SP release. These order numbers include:

<sup>3</sup> the base order number to which you must apply any subsequent TNL/supplement order numbers. Asterisks (\*\*\*\*\*) in this column indicate that there is a new base order number for this release. (For the new base order number, see <sup>5</sup>.)

<sup>4</sup> the prerequisite TNL/supplement order numbers that you must apply for this MVS/SP release. None in this column indicates that you do not need any prerequisite TNLS/supplements.

<sup>5</sup> the TNL/supplement/new base order numbers that contain the information for this MVS/SP release. None in this column indicates that this publication/microfiche was not updated for this release.

Some examples of how to use the information in Figure 4-1 are:

- To have the MVS/SP Release 3.3 level of *OS/VS2 MVS System Logic Library Volume 7*, you need the base book LY28-1083-0, to which you must add the prerequisite TNL LN28-5025 and the Release 3 supplement LD23-0290-0. If you already have the base book and the prerequisite TNL, you only need to order the Release 3 supplement.
- To have the MVS/SP Release 3 level of *Operator's Library: OS/VS2 System Commands*, you only need the new base book GC28-1031-2. The asterisks (\*\*\*\*\*) in the BASE BOOK column mean that there is a new base book for this release. The new base book's order number is listed in the RELEASE 3 column. The None in the PREREQUISITE column means that you do not need any prerequisite TNLs/supplements for this publication. So if you have GC28-1031-2, you have the MVS/SP Release 3 level of this book.
- To have the MVS/SP Release 3 level of *OS/VS2 SPL: TSO*, you need the base book GC28-0629-3, to which you must add the prerequisite TNL GN28-2971 and the prerequisite supplement GD23-0227-0. The None in the RELEASE 3 column indicates that you do not need a Release 3 TNL/supplement for this publication because this book was not updated for MVS/SP Release 3.



## MVS/SP Release 1 Publications

Title	Order Numbers		
	Base	Prerequisite	Release 1
Operator's Library: OS/VS2 MVS System Commands	*****	None	GT28-1031 formerly GC28-1031-1
OS/VS2 SPL: Initialization and Tuning Guide	*****	None	GT28-1029 formerly GC28-1029-1
OS/VS2 SPL: System Management Facilities	*****	None	GT28-1030 formerly GC28-1030-1
OS/VS2 SPL: Supervisor	GC28-0628-3	GN28-4740 GN28-4738	GD23-0177-1
OS/VS2 MVS JCL	GC28-0692-5		
OS/VS2 SPL: Job Management	GC28-0627-2	GN28-4681	GD23-0176-2
OS/VS Message Library: VS2 System Messages	GT00-0864 formerly GC38-1002-7	GN28-4689 GN28-4739 GN28-4750 GN28-4937	GD23-0173-2
OS/VS Message Library: VS2 System Codes	GT00-0706 formerly GC38-1008-5	None	GD23-0174-2
OS/VS Message Library: VS2 Routing and Descriptor Codes	GQ38-1102 formerly GC38-1102-2	GN28-4690	GD23-0175-3
OS/VS2 SPL: Debugging Handbook, Volume 1	GC28-0708-1	GD23-0116-0 (SU 64) GN28-2967 GN28-2984 GN28-4692	GD23-0180-1
OS/VS2 SPL: Debugging Handbook, Volume 2	GC28-0709-1	GD23-0117-0 (SU 64) GN28-2968 GN28-4680 GN28-4693	SD23-0181-1
OS/VS2 SPL: Debugging Handbook, Volume 3	GC28-0710-0	GD23-0118-0 (SU 64) GN28-2972 GN28-2983 GN28-4694	SD23-0182-1
OS/VS2 SPL: MVS Diagnostic Techniques	GC28-0725-2	GD23-0141-0 (SU 64) GN28-2993	ST83-0183 formerly SD23-0183-0

Title	Order Numbers		
	Base	Prerequisite	Release 1
OS/VS2 MVS System Initialization Logic	SY28-0623-2	SD23-0123-2 (SU 64)	LD23-0192-1
OS/VS2 MVS System Logic Library, Volume 1	*****	None	SQ68-0713 formerly SY28-0713-5
OS/VS2 MVS System Logic Library, Volume 2	SY28-0714-2	None	LD23-0186-1
OS/VS2 MVS System Logic Library, Volume 3	SY28-0715-2	SN28-4722	LD23-0187-1
OS/VS2 MVS System Logic Library, Volume 4	SY28-0716-2	None	LD23-0188-1
OS/VS2 MVS System Logic Library, Volume 5	SY28-0717-2	SN28-4701	LT83-0189 formerly LD23-0189-1
OS/VS2 MVS System Logic Library, Volume 6	SY28-0718-2	None	LT83-0190 formerly LD23-0190-1
OS/VS2 MVS System Logic Library, Volume 7	SY28-0719-2	SN28-4702	LT83-0191 formerly LD23-0191-1
OS/VS2 SPL: Service Aids	GT28-0674 formerly GC28-0674-3	GD23-0122-0 (SU 64) GN28-4686	GD23-0178-2
Environmental Record Editing and Printing User's Guide and Reference	GC28-1378-0	GN28-5054 GN28-5055	
OS/VS2 SPL: OLTEP	*****	None	GC28-0675-4
OS/VS2 I/O Supervisor Logic	LY28-1383-0	None	None
OS/VS2 Service Aids Logic	SY28-0643-4	SD23-0131-0 (SU 64) SN28-2912	LT83-0194 formerly LD23-0194-1
OS/VS2 OLTEP Logic	SY28-0676-3	None	None
OS/VS2 SPL: SYS1.LOGREC Error Recording	*****	None	GT28-0677 formerly GC28-0677-5
OS/VS2 SYS1.LOGREC Error Recording Logic	*****	None	SY28-0678-5
OS/VS2 SPL: System Generation Reference	GC26-3792-8	None	GD26-6024-1

## MVS/SP Release 1 Microfiche

Title	Order Numbers		
	Base	Prerequisite	Release 1
OS/VS2 Data Areas (for MVS/SP JES3)	SYB8-0606-5	None	LYB8-1034-0
OS/VS2 Directory (for MVS/SP JES3)	SYB8-0743-2	None	LYB8-1035-0
OS/VS2 Symbol Usage Table (for MVS/SP JES3)	SYB8-0744-2	None	LYB8-1036-0
OS/VS2 Data Area Usage Table (for MVS/SP JES3)	SYB8-0742-2	None	LYB8-1037-0
OS/VS2 Data Areas (for MVS/SP JES2)	SYB8-0606-5	None	LYB8-1038-0
OS/VS2 Directory (for MVS/SP JES2)	SYB8-0743-2	None	LYB8-1039-0
OS/VS2 Symbol Usage Table (for MVS/SP JES2)	SYB8-0744-2	None	LYB8-1040-0
OS/VS2 Data Area Usage Table (for MVS/SP JES2)	SYB8-0742-2	None	LYB8-1041-0

## MVS/SP Release 1 Enhancement Publications

Title	Order Numbers		
	Base	Prerequisite	Release 1 Enhancement
Operator's Library: OS/VS2 MVS System Commands	GT28-1031 formerly GC28-1031-1	None	GN28-4765
OS/VS2 SPL: Initialization and Tuning Guide	GT28-1029 formerly GC28-1029-1	None	GN28-4764
OS/VS2 SPL: System Management Facilities	GT28-1030 formerly GC28-1030-1	None	GN28-4769
OS/VS2 SPL: Supervisor	GC28-0628-3	GN28-4740 GN28-4738 GD23-0177-1	GN28-4990
OS/VS2 MVS JCL	GC28-0692-5		
OS/VS2 SPL: Job Management	GC28-0627-2	GN28-4681 GD23-0120-0 (SU 64) GD23-0176-2	None
OS/VS Message Library: VS2 System Messages	GT00-0864 formerly GC38-1002-7	GN28-4689 GN28-4739 GN28-4750	GD23-0173-2
OS/VS Message Library: VS2 System Codes	GT00-0706 formerly GC38-1008-5	GN28-4751	GD23-0174-2
OS/VS Message Library: VS2 Routing and Descriptor Codes	GQ38-1102 formerly GC38-1102-2	GN28-4690 GN28-4752	GD23-0175-3
OS/VS2 SPL: Debugging Handbook, Volume 1	GC28-0708-1	GD23-0116-0 (SU 64) GN28-2967 GN28-2984 GN28-4692 GD23-0180-1	GN28-4796
OS/VS2 SPL: Debugging Handbook, Volume 2	GC28-0709-1	GD23-0117-0 GN28-2968 GN28-4680 GN28-4693 SD23-0181-1	SN28-4766
OS/VS2 SPL: Debugging Handbook, Volume 3	GC28-0710-0	GD23-0118-0 GN28-2972 GN28-2983 GN28-4694 SD23-0182-1	SN28-4767
OS/VS2 SPL: MVS Diagnostic Techniques	GC28-0725-2	GD23-0141-0 (SU 64) GN28-2993 ST83-0183 formerly SD23-0183-0	SN28-4768

Title	Order Numbers		
	Base	Prerequisite	Release 1 Enhancement
OS/VS2 MVS System Initialization Logic	SY28-0623-2	SD23-0123-0 (SU 64) LD23-0192-1	LN28-4788
OS/VS2 MVS System Logic Library, Volume 1	*****	None	SQ68-0713 formerly SY28-0713-5
OS/VS2 MVS System Logic Library, Volume 2	SY28-0714-2	LD23-0186-1	LN28-4909
OS/VS2 MVS System Logic Library, Volume 3	SY28-0715-2	SN28-4722 LD23-0187-1	None
OS/VS2 MVS System Logic Library, Volume 4	SY28-0716-2	LD23-0188-1	LN28-4772
OS/VS2 MVS System Logic Library, Volume 5	SY28-0717-2	SN28-4701 LT83-0189 formerly LD23-0189-1	LN28-4773
OS/VS2 MVS System Logic Library, Volume 6	SY28-0718-2	LT83-0190 formerly LD23-0190-1	LN28-4797
OS/VS2 MVS System Logic Library, Volume 7	SY28-0719-2	SN28-4702 LT83-0191 formerly LD23-0191-1	LN28-4774
OS/VS2 SPL: Service Aids	GT28-0674 formerly GC28-0674-3	GD23-0122-0 (SU 64) GN28-4686 GD23-0178-2	
Environmental Record Editing and Printing User's Guide and Reference	GC28-1378-0	GN28-5054 GN28-5055	
OS/VS2 SPL: OLTEP	GC28-0675-4	None	None
OS/VS2 I/O Supervisor Logic	LY28-1383-0	None	None
OS/VS2 Service Aids Logic	SY28-0643-4	SD23-0131-0 (SU 64) SN28-2912 LT83-0194 formerly LD23-0194-1	LN28-4789
OS/VS2 OLTEP Logic	SY28-0676-3	None	None
OS/VS2 SPL: SYS1.LOGREC Error Recording	GT28-0677 formerly GC28-0677-5	None	None
OS/VS2 SYS1.LOGREC Error Recording Logic	SY28-0678-5	None	None
OS/VS2 SPL: System Generation Reference	GC26-3792-8	None	GD26-6027-0
Input/Output Configuration Program Users Guide and Reference	*****	None	GC28-1027-2

## MVS/SP Release 1 Enhancement Microfiche

Title	Order Numbers		
	Base	Prerequisite	Release 1 Enhancement
OS/VS2 Data Areas (for MVS/SP JES3)	SYB8-0606-5	None	LNB8-4777
OS/VS2 Directory (for MVS/SP JES3)	SYB8-0743-2	None	LNB8-4778
OS/VS2 Symbol Usage Table (for MVS/SP JES3)	SYB8-0744-2	None	LNB8-4779
OS/VS2 Data Area Usage Table (for MVS/SP JES3)	SYB8-0742-2	None	LNB8-4780
OS/VS2 Data Areas (for MVS/SP JES2)	SYB8-0606-5	None	LNB8-4781
OS/VS2 Directory (for MVS/SP JES2)	SYB8-0743-2	None	LNB8-4782
OS/VS2 Symbol Usage Table (for MVS/SP JES2)	SYB8-0744-2	None	LNB8-4783
OS/VS2 Data Area Usage Table (for MVS/SP JES2)	SYB8-0742-2	None	LNB8-4784

## MVS/SP Release 3 Publications

Title	Order Numbers		
	Base	Prerequisite	Release 3
Operator's Library: OS/VS2 MVS System Commands	*****	None	GC28-1031-2
OS/VS2 SPL: Initialization and Tuning Guide	*****	None	GQ28-1029 formerly GC28-1029-2
OS/VS2 SPL: System Management Facilities	GQ28-1030 formerly GC28-1030-2	None	GD23-0239-0
OS/VS2 SPL: Supervisor	GT28-1046 formerly GC28-1046-0		
OS/VS2 Supervisor Services and Macros	*****	None	GC28-1114-0
OS/VS2 MVS JCL	GC28-0692-5		
OS/VS2 SPL: Job Management	*****	None	GC28-0627-3
OS/VS Message Library: VS2 System Messages	GT00-0864 formerly GC38-1002-7	GN28-4689 GN28-4739 GN28-4750 GN28-4937	GD23-0173-2
OS/VS Message Library: VS2 System Codes	*****	None	GC38-1008-7
OS/VS Message Library: VS2 Routing and Descriptor Codes	GQ38-1102 formerly GC38-1102-2	GN28-4690 GN28-4752	GD23-0175-3
OS/VS2 SPL: Debugging Handbook, Volume 1	GT28-1047 formerly GC28-1047-0	None	GN28-4921
OS/VS2 SPL: Debugging Handbook, Volume 2	*****	None	GT28-1048 formerly GC28-1048-1
OS/VS2 SPL: Debugging Handbook, Volume 3	*****	None	GT28-1049 Formerly GC28-1049-1
OS/VS2 SPL: MVS Diagnostic Techniques	*****	None	ST68-1133 formerly SY28-1133-0
OS/VS2 MVS Interactive Problem Control System for MVS/System Product Guide and Reference	*****	None	GC28-2059-0
OS/VS2 MVS Interactive Problem Control System for MVS/System Product Messages and Codes	*****	None	GC28-2060-0
OS/VS2 MVS Interactive Problem Control System for MVS/System Product Logic	*****	None	GC28-2061-0
OS/VS2 MVS System Initialization Logic	*****	None	LQ68-1050 formerly LY28-1050-1 LN28-5068

Title	Order Numbers		
	Base	Prerequisite	Release 3
OS/VS2 MVS System Logic Library, Volume 1 (See note.)	*****	None	ST00-0910 formerly SY28-0713-7
OS/VS2 MVS System Logic Library, Volume 2	*****	None	LT68-1063 formerly LY28-1063-0
OS/VS2 MVS System Logic Library, Volume 3	*****	None	LT68-1067 formerly LY28-1067-0
OS/VS2 MVS System Logic Library, Volume 4	*****	None	LT68-1071 formerly LY28-1071-0
OS/VS2 MVS System Logic Library, Volume 5	*****	None	LY28-1075-0
OS/VS2 MVS System Logic Library, Volume 6	*****	None	LY28-1079-0
OS/VS2 MVS System Logic Library, Volume 7	*****	None	LT68-1083 formerly LY28-1083-0
OS/VS2 MVS System Logic Library, Volume 8	*****	None	LT68-1087 formerly LY28-1087-0
OS/VS2 MVS System Logic Library, Volume 9	*****	None	LT68-1091 formerly LY28-1091-0
OS/VS2 MVS System Logic Library, Volume 10	*****	None	LY28-1095-0
OS/VS2 MVS System Logic Library, Volume 11	*****	None	LT68-1099 formerly LY28-1099-0
OS/VS2 SPL: Service Aids	GT28-0674 formerly GC28-0674-3	GD23-0122-0 (SU 64) GN28-4686 GD23-0178-2	GN28-4920
Environmental Record Editing and Printing User's Guide and Reference	GC28-1378-0	GN28-5054 GN28-5055	
OS/VS2 SPL: OLTEP	GC28-0675-4	None	None
OS/VS2 I/O Supervisor Logic	LY28-1383-0	None	None
OS/VS2 Service Aids Logic	SY28-0643-4	SD23-0131-0 (SU 64) SN28-2912 LD23-0194-2	LN28-4926
OS/VS2 OLTEP Logic	SY28-0676-3	None	None
OS/VS2 SPL: SYS1.LOGREC Error Recording	GT28-0677 formerly GC28-0677-5	None	None
OS/VS2 SYS1.LOGREC Error Recording Logic	SY28-0678-5	SN28-5080	None
<p><i>Note:</i> The System Logic Library (SLL) has been revised and reorganized for MVS/SP Release 3. The SLL now contains 11 volumes instead of the previous 7 volumes. Refer to the Preface of each volume to see what information is documented in that volume. Also note that the order numbers for the 11 volumes of the SLL are not consecutive.</p>			



Title	Order Numbers		
	Base	Prerequisite	Release 3
OS/VS2 SPL: System Generation Reference	GC26-3792-8	GD26-6027-0	None
Input/Output Configuration Program Users Guide and Reference	GC28-1027-2	None	None
OS/VS2 SPL: TSO	GC28-0629-3	GN28-2971 GD23-0227-0	None
TSO Command Language Reference	GC28-0646-4	GN28-4699 GN28-4754 GD23-0228-0	GN28-4924
OS/VS2 TSO Guide to Writing a Terminal Monitor Program or a Control Program	GC28-0648-3	GN28-2998 GN28-4688 GN28-4749	GD23-0240-0
Global Resource Serialization Logic	LT68-1059 formerly LY28-1059-0	None	LN28-4927
SPL: JES2 Installation, Initialization, and Tuning	ST23-0046 formerly SC23-0046-1	None	None
Operator's Library: JES2 Commands	ST23-0048 formerly SC23-0048-1	None	None
Operator's Library: JES2 Command Syntax	ST00-0959 formerly SX23-0008-0	None	None
JES2 Logic	LT64-6006 formerly LY24-6006-0	LN25-0194	None
JES3 Introduction	GT23-0039 formerly GC23-0039-0	None	None
JES3 Overview	SC23-0040-0	None	None
JES3 SPL: Installation, Planning, and Tuning	ST23-0041 formerly SC23-0041-1	None	None
JES3 SPL: User Modifications and JES3 Macros	ST23-0042 formerly SC23-0042-0	None	None
JES3 SPL: Diagnosis	ST23-0043 formerly SC23-0043-0	None	None
JES3 Logic	LY24-6005-0	None	None
JES3 Messages	GT23-0044 formerly GC23-0044-0	None	None
JES3 Operator's Library	ST23-0045 formerly SC23-0045-0	None	None
JES3 Operator's Library: Reference Summary	ST23-0007 formerly SX23-0007-0	None	None

## MVS/SP Release 3 Microfiche

Title	Order Numbers		
	Base	Prerequisite	Release 3
OS/VS2 Data Areas (for MVS/SP JES3)	LYB8-1055-0	None	LNB8-4934
OS/VS2 Directory (for MVS/SP JES3)	LYB8-1057-0	None	LNB8-4943
OS/VS2 Symbol Usage Table (for MVS/SP JES3)	LYB8-1058-0	None	LNB8-4936
OS/VS2 Data Area Usage Table (for MVS/SP JES3)	LYB8-1056-0	None	LNB8-4935
OS/VS2 Data Areas (for MVS/SP JES2)	LYB8-1051-0	None	LNB8-4931
OS/VS2 Directory (for MVS/SP JES2)	LYB8-1053-0	None	LNB8-4942
OS/VS2 Symbol Usage Table (for MVS/SP JES2)	LYB8-1054-0	None	LNB8-4933
OS/VS2 Data Area Usage Table (for MVS/SP JES2)	LYB8-1052-0	None	LNB8-4932

## MVS/SP Release 3.1 Publications

Title	Order Numbers		
	Base	Prerequisite	Release 3.1
Operator's Library: OS/VS2 MVS System Commands	GC28-1031-2	None	None
OS/VS2 SPL: Initialization and Tuning Guide	GQ28-1029 formerly GC28-1029-2	None	GN28-4951
OS/VS2 SPL: System Management Facilities	GQ28-1030 formerly GC28-1030-2	GD23-0239-0	GN28-4986
OS/VS2 SPL: Supervisor	GT28-1046 formerly GC28-1046-0		
OS/VS2 Supervisor Services and Macros	GC28-1114-0	None	None
OS/VS2 MVS JCL	GC28-0692-5		
OS/VS2 SPL: Job Management	*****	None	GC28-0627-3
OS/VS Message Library: VS2 System Messages	GT00-0960 formerly GC38-1002-8	None	GN28-4957
OS/VS2 Message Library: VS2 System Codes	GC38-1008-7	GN28-4973	GN28-4987
OS/VS Message Library: VS2 Routing and Descriptor Codes	GQ38-1102 formerly GC38-1102-2	GN28-4690 GN28-4752 GD23-0175-3	GN28-4985
OS/VS2 SPL: Debugging Handbook, Volume 1	GT28-1047 formerly GC28-1047-0	GN28-4921	GN28-4952
OS/VS2 SPL: Debugging Handbook, Volume 2	GT28-1048 formerly GC28-1048-1	None	GN28-4981
OS/VS2 SPL: Debugging Handbook, Volume 3	GT28-1049 formerly GT28-1049-1	None	GN28-4953
OS/VS2 SPL: MVS Diagnostic Techniques	ST68-1133 formerly SY28-1133-0	None	None
OS/VS2 MVS Interactive Problem Control System for MVS/System Product Guide and Reference	GC28-2059-0	None	None
OS/VS2 MVS Interactive Problem Control System for MVS/System Product Messages and Codes	GC28-2060-0	None	None
OS/VS2 MVS Interactive Problem Control System for MVS/System Product Logic	GC28-2061-0	None	None
OS/VS2 MVS System Initialization Logic	LQ68-1050 formerly LY28-1050-1	LN28-5068	LN28-4982

Title	Order Numbers		
	Base	Prerequisite	Release 3.1
OS/VS2 MVS System Logic Library, Volume 1 (See note.)	ST00-0910 formerly SY28-0713-7	None	SN28-4993
OS/VS2 MVS System Logic Library, Volume 2	LT68-1063 formerly LY28-1063-0	None	None
OS/VS2 MVS System Logic Library, Volume 3	LT68-1067 formerly LY28-1067-0	None	LN28-4961
OS/VS2 MVS System Logic Library, Volume 4	LT68-1071 formerly LY28-1071-0	None	LN28-5001
OS/VS2 MVS System Logic Library, Volume 5	LY28-1075-0	None	None
OS/VS2 MVS System Logic Library, Volume 6	LY28-1079-0	None	LN28-4984
OS/VS2 MVS System Logic Library, Volume 7	LT68-1083 formerly LY28-1083-0	None	None
OS/VS2 MVS System Logic Library, Volume 8	LT68-1087 formerly LY28-1087-0	None	None
OS/VS2 MVS System Logic Library, Volume 9	LT68-1091 formerly LY28-1091-0	None	LN28-5004
OS/VS2 MVS System Logic Library, Volume 10	LY28-1095-0	None	None
OS/VS2 MVS System Logic Library, Volume 11	LT68-1099 formerly LY28-1099-0	None	LN28-4992
OS/VS2 SPL: Service Aids	GT28-0674 formerly GC28-0674-3	GD23-0122-0 (SU 64) GN28-4686 GD23-0178-2 GN28-4920	GN28-4944
Environmental Record Editing and Printing User's Guide and Reference	GC28-1378-0	GN28-5054 GN28-5055	
OS/VS2 SPL: OLTEP	GC28-0675-4	None	None
OS/VS2 I/O Supervisor Logic	LY28-1383-0	None	None
OS/VS2 Service Aids Logic	SY28-0643-4	SD23-0131-0 (SU 64) SN28-2912 LD23-0194-2 LN28-4926	LN28-4950
<p><i>Note:</i> The System Logic Library (SLL) has been revised and reorganized for MVS/SP Release 3. The SLL now contains 11 volumes instead of the previous 7 volumes. Refer to the Preface of each volume to see what information is documented in that volume. Also note that the order numbers for the 11 volumes of the SLL are not consecutive.</p>			

Title	Order Numbers		
	Base	Prerequisite	Release 3.1
OS/VS2 OLTEP Logic	SY28-0676-3	None	None
OS/VS2 SPL: SYS1.LOGREC Error Recording GC28-0677-5	GT28-0677 formerly	None	None
OS/VS2 SYS1.LOGREC Error Recording Logic	SY28-0678-5	SN28-5080	None
OS/VS2 SPL: System Generation Reference	GC26-3792-8	GD26-6027-0	None
Input/Output Configuration Program Users Guide and Reference	GC28-1027-2	None	None
OS/VS2 SPL: TSO	GC28-0629-3	GN28-2971 GD23-0227-0	None
TSO Command Language Reference	GC28-0646-4	GN28-4699 GN28-4754 GD23-0228-0 GN28-4924	None
OS/VS2 TSO Guide to Writing a Terminal Monitor Program or a Control Program	GC28-0648-3	GD23-0240-0 GN28-2998 GN28-4688 GN28-4749	None
Global Resource Serialization Logic	LT68-1059 formerly LY28-1059-0	LN28-4927	None
SPL: JES2 Installation, Initialization, and Tuning	ST23-0046 formerly SC23-0046-1	None	None
Operator's Library: JES2 Commands	ST23-0048 formerly SC23-0048-1	None	None
Operator's Library: JES2 Command Syntax	ST00-0959 formerly SX23-0008-0	None	None
JES2 Logic	LT64-6006 formerly LY24-6006-0	LN25-0194	None
JES3 Introduction	GT23-0039 formerly GC23-0039-0	None	GN25-0198
JES3 Overview	SC23-0040-0	None	SN25-0199
JES3 SPL: Installation, Planning, and Tuning	SQ23-0041 formerly SC23-0041-3	None	None
JES3 SPL: User Modifications and JES3 Macros	SC23-0042-1	None	SN28-5047
JES3 SPL: Diagnosis	*****	None	SC23-0043-1
JES3 Logic	LY24-6005-0	None	LN25-0197

Title	Order Numbers		
	Base	Prerequisite	Release 3.1
JES3 Messages	GQ23-0044 formerly GC23-0044-1	None	None
JES3 Operator's Library	*****	None	SQ23-0045 formerly SC23-0045-1
JES3 Operator's Library: Reference Summary	*****	None	ST00-1398-1 formerly SX23-0007-1

## MVS/SP Release 3.1 Microfiche

Title	Order Numbers		
	Base	Prerequisite	Release 3.1
OS/VS2 Data Areas (for MVS/SP JES3)	LYB8-1055-0	LNB8-4934	LNB8-4995
OS/VS2 Symbol Usage Table (for MVS/SP JES3)	LYB8-1058-0	LNB8-4936	LNB8-4997
OS/VS2 Data Area Usage Table (for MVS/SP JES3)	LYB8-1056-0	LNB8-4935	LNB8-4996
OS/VS2 Data Areas (for MVS/SP JES2)	LYB8-1051-0	LNB8-4931	LNB8-4998
OS/VS2 Symbol Usage Table (for MVS/SP JES2)	LYB8-1054-0	LNB8-4933	LNB8-5000
OS/VS2 Data Area Usage Table (for MVS/SP JES2)	LYB8-1052-0	LNB8-4932	LNB8-4999

## MVS/SP Release 3.2 Publications

Title	Order Numbers		
	Base	Prerequisite	Release 3.2
Operator's Library: OS/VS2 MVS System Commands	GC28-1031-2	GN28-4975	GN28-5013
OS/VS2 SPL: Initialization and Tuning Guide	GT28-1029 formerly GC28-1029-3	None	None
OS/VS2 SPL: System Management Facilities	GQ28-1030 formerly GC28-1030-2	GD23-0239-0 GN28-4986	None
OS/VS2 SPL: Supervisor	GT28-1046 formerly GC28-1046-0		
OS/VS2 Supervisor Services and Macros	GC28-1114-0	None	None
OS/VS2 MVS JCL	GC28-0692-5		
OS/VS2 SPL: Job Management	*****	None	GC28-0627-3
OS/VS Message Library: VS2 System Messages	GT00-0960 formerly GC38-1002-8	GN28-4957	GN28-5010
OS/VS2 Message Library: VS2 System Codes	GC38-1008-7	GN28-4973 GN28-4987	GN28-5011
OS/VS Message Library: VS2 Routing and Descriptor Codes	GQ38-1102 formerly GC38-1102-2	GN28-4690 GN28-4752 GD23-0175-3 GN28-4985	GN28-5012
OS/VS2 SPL: Debugging Handbook, Volume 1	GT28-1047 formerly GC28-1047-0	GN28-4921 GN28-4952	GN28-5045
OS/VS2 SPL: Debugging Handbook, Volume 2	GT28-1048 formerly GC28-1048-1	GN28-4981	GN28-5007
OS/VS2 SPL: Debugging Handbook, Volume 3	GT28-1049 formerly GC28-1049-1	GN28-4953	GN28-5008
OS/VS2 SPL: MVS Diagnostic Techniques	ST68-1133 formerly SY28-1133-0	None	SN28-5014
OS/VS2 MVS Interactive Problem Control System for MVS/System Product Guide and Reference	GC28-2059-0	None	None
OS/VS2 MVS Interactive Problem Control System for MVS/System Product Messages and Codes	GC28-2060-0	None	None
OS/VS2 MVS Interactive Problem Control System for MVS/System Product Logic	GC28-2061-0	None	None
OS/VS2 MVS System Initialization Logic	LQ68-1050 formerly LY28-1050-1	LN28-4982 LN28-5068	LN28-5022



Title	Order Numbers		
	Base	Prerequisite	Release 3.2
OS/VS2 MVS System Logic Library, Volume 1 (See note.)	*****	None	ST00-0961 formerly SY28-0713-8
OS/VS2 MVS System Logic Library, Volume 2	LT68-1063 formerly LY28-1063-0	None	LN28-5016
OS/VS2 MVS System Logic Library, Volume 3	LT68-1067 formerly LY28-1067-0	LN28-4961	LN28-5017
OS/VS2 MVS System Logic Library, Volume 4	LT68-1071 formerly LY28-1071-0	LN28-5001	LN28-5018
OS/VS2 MVS System Logic Library, Volume 5	LY28-1075-0	None	LN28-5019
OS/VS2 MVS System Logic Library, Volume 6	LY28-1079-0	LN28-4984	LN28-5020
OS/VS2 MVS System Logic Library, Volume 7	LT68-1083 formerly LY28-1083-0	None	LN28-5025
OS/VS2 MVS System Logic Library, Volume 8	LT68-1087 formerly LY28-1087-0	None	LN28-5026
OS/VS2 MVS System Logic Library, Volume 9	LT68-1091 formerly LY28-1091-0	LN28-5004	LN28-5027
OS/VS2 MVS System Logic Library, Volume 10	LY28-1095-0	None	LN28-5028
OS/VS2 MVS System Logic Library, Volume 11	LT68-1099 formerly LY28-1099-0	LN28-4992	LN28-5021
OS/VS2 SPL: Service Aids	GT28-0674 formerly GC28-0674-3	GD23-0122-0 (SU 64) GN28-4686 GD23-0178-2 GN28-4920 GN28-4944	None
Environmental Record Editing and Printing User's Guide and Reference	GC28-1378-0	GN28-5054 GN28-5055	
OS/VS2 SPL: OLTEP	GC28-0675-4	None	None
OS/VS2 I/O Supervisor Logic	LY28-1383-0	None	None
OS/VS2 Service Aids Logic	SY28-0643-4	SD23-0131-0 (SU 64) SN28-2912 LD23-0194-2 LN28-4926 LN28-4950	None
<p><i>Note:</i> The System Logic Library (SLL) has been revised and reorganized for MVS/SP Release 3. The SLL now contains 11 volumes instead of the previous 7 volumes. Refer to the Preface of each volume to see what information is documented in that volume. Also note that the order numbers for the 11 volumes of the SLL are not consecutive.</p>			

Title	Order Numbers		
	Base	Prerequisite	Release 3.2
OS/VS2 OLTEP Logic	SY28-0676-3	None	None
OS/VS2 SPL: SYS1.LOGREC Error Recording	GT28-0677 formerly GC28-0677-5	None	None
OS/VS2 SYS1.LOGREC Error Recording Logic	SY28-0678-5	SN28-5080	None
OS/VS2 SPL: System Generation Reference	GC26-3792-8	GD26-6027-0	None
Input/Output Configuration Program Users Guide and Reference	GC28-1027-2	None	None
OS/VS2 SPL: TSO	GC28-0629-3	GN28-2971 GD23-0227-0	None
TSO Command Language Reference	GC28-0646-4	GN28-4699 GN28-4754 GD23-0228-0 GN28-4924	None
OS/VS2 TSO Guide to Writing a Terminal Monitor Program or a Control Program	GC28-0648-3	GD23-0240-0 GN28-2998 GN28-4688 GN28-4749	None
Global Resource Serialization Logic	LT68-1059 formerly LY28-1059-0	LN28-4927	None
SPL: JES2 Installation, Initialization, and Tuning	ST23-0046 formerly SC23-0046-1	None	None
Operator's Library: JES2 Commands	ST23-0048 formerly SC23-0048-1	None	None
Operator's Library: JES2 Command Syntax	ST00-0959 formerly SX23-0008-0	None	None
JES2 Logic	LT64-6006 formerly LY24-6006-0	LN25-0194	None
JES3 Introduction	GT23-0039 formerly GC23-0039-0	GN25-0198	None
JES3 Overview	SC23-0040-0	SN25-0199	None
JES3 SPL: Installation, Planning, and Tuning	SQ23-0041 formerly SC23-0041-3	None	None
JES3 SPL: User Modifications and JES3 Macros	SC23-0042-1	SN28-5047	None
JES3 SPL: Diagnosis	SC23-0043-1	None	None
JES3 Logic	LY24-6005-0	LN25-0197	None

Title	Order Numbers		
	Base	Prerequisite	Release 3.2
JES3 Messages	GQ23-0044 formerly GC23-0044-1	None	None
JES3 Operator's Library	SQ23-0045 formerly SC23-0045-1	None	None
JES3 Operator's Library: Reference Summary	ST00-1398-1 formerly SX23-0007-1	None	None

## MVS/SP Release 3.2 Microfiche

Title	Order Numbers		
	Base	Prerequisite	Release 3.2
OS/VS2 Data Areas (for MVS/SP JES3)	LYB8-1055-0	LNB8-4934 LNB8-4995	LNB8-5032
OS/VS2 Symbol Usage Table (for MVS/SP JES3)	LYB8-1058-0	LNB8-4936 LNB8-4997	LNB8-5034
OS/VS2 Data Area Usage Table (for MVS/SP JES3)	LYB8-1056-0	LNB8-4935 LNB8-4996	LNB8-5033
OS/VS2 Data Areas (for MVS/SP JES2)	LYB8-1051-0	LNB8-4931 LNB8-4998	LNB8-5029
OS/VS2 Symbol Usage Table (for MVS/SP JES2)	LYB8-1054-0	LNB8-4933 LNB8-5000	LNB8-5031
OS/VS2 Data Area Usage Table (for MVS/SP JES2)	LYB8-1052-0	LNB8-4932 LNB8-4999	LNB8-5030

## MVS/SP Release 3.3 Publications

Title	Order Numbers		
	Base	Prerequisite	Release 3.3
Operator's Library: OS/VS2 MVS System Commands	GC28-1031-2	GN28-4975 GN28-5013	GN28-0771
OS/VS2 SPL: Initialization and Tuning Guide	GT28-1029 formerly GC28-1029-3	None	None
OS/VS2 SPL: System Management Facilities	GQ28-1030 formerly GC28-1030-2	GN28-4986	GN28-0768
OS/VS2 SPL: Supervisor	GT28-1046 formerly GC28-1046-0		
OS/VS2 Supervisor Services and Macros	GC28-1114-0	None	None
MVS JCL	*****	None	GT28-1300 formerly GC28-1300-0
OS/VS2 SPL: Job Management	*****	None	GC28-1303-0
MVS/370 System Messages	*****	None	GC28-1374-2
MVS/370 System Messages	*****	None	GC28-1375-2
OS/VS2 Message Library: VS2 System Codes	GC38-1008-7	None	GN28-0873
OS/VS Message Library: VS2 Routing and Descriptor Codes	*****	None	GT00-1710 formerly GC28-1102-3
OS/VS2 SPL: Debugging Handbook, Volume 1	GT28-1047 formerly GC28-1047-0	GN28-4921 GN28-4952 GN28-5045	GN28-5051
OS/VS2 SPL: Debugging Handbook, Volume 2	GT28-1048 formerly GC28-1048-1	GN28-4981 GN28-5007	GN28-5052
OS/VS2 SPL: Debugging Handbook, Volume 3	GT28-1049 formerly GC28-1049-1	GN28-4953 GN28-5008	GN28-5053
OS/VS2 SPL: MVS Diagnostic Techniques	ST68-1133 formerly SY28-1133-0	SN28-5014	None
MVS IPCS User's Guide and Reference	*****	None	GC28-1183-0
MVS IPCS Messages and Codes	*****	None	GC28-1182-0
MVS IPCS Logic and Diagnosis	*****	None	LY28-1184-0
OS/VS2 MVS System Initialization Logic	LQ68-1050 formerly LY28-1050-1	LN28-4982 LN28-5022 LN28-5068	None

Title	Order Numbers		
	Base	Prerequisite	Release 3.3
OS/VS2 MVS System Logic Library, Volume 1 (See note.)	*****	None	ST00-1479 formerly SY28-0713-9
OS/VS2 MVS System Logic Library, Volume 2	LT68-1063 formerly LY28-1063-0	LN28-5016	LD23-0288-0
OS/VS2 MVS System Logic Library, Volume 3	LT68-1067 formerly LY28-1067-0	LN28-4961 LN28-5017	None
OS/VS2 MVS System Logic Library, Volume 4	LT68-1071 formerly LY28-1071-0	LN28-5001 LN28-5018	LD23-0289-0
OS/VS2 MVS System Logic Library, Volume 5	LY28-1075-0	LN28-5019	None
OS/VS2 MVS System Logic Library, Volume 6	LY28-1079-0	LN28-4984 LN28-5020	LD23-0301-0
OS/VS2 MVS System Logic Library, Volume 7	LT68-1083 formerly LY28-1083-0	LN28-5025	LD23-0290-0
OS/VS2 MVS System Logic Library, Volume 8	LT68-1087 formerly LY28-1087-0	LN28-5026	None
OS/VS2 MVS System Logic Library, Volume 9	LT68-1091 formerly LY28-1091-0	LN28-5027	LD23-0291-0
OS/VS2 MVS System Logic Library, Volume 10	LY28-1095-0	LN28-5028	None
OS/VS2 MVS System Logic Library, Volume 11	*****	None	LQ68-1099 formerly LY28-1099-1
OS/VS2 SPL: Service Aids	GT28-0674 formerly GC28-0674-3	GD23-0122-0 (SU 64) GN28-4686 GD23-0178-2 GN28-4920 GN28-4944	None
Environmental Record Editing and Printing User's Guide and Reference	GC28-1378-0	GN28-5054 GN28-5055	
OS/VS2 SPL: OLTEP	GC28-0675-4	None	None
OS/VS2 I/O Supervisor Logic	LY28-1383-0	None	None
OS/VS2 Service Aids Logic	SY28-0643-4	SD23-0131-0 (SU 64) SN28-2912 LD23-0194-2 LN28-4926 LN28-4950	None
<p><i>Note:</i> The System Logic Library (SLL) has been revised and reorganized for MVS/SP Release 3. The SLL now contains 11 volumes instead of the previous 7 volumes. Refer to the Preface of each volume to see what information is documented in that volume. Also note that the order numbers for the 11 volumes of the SLL are not consecutive.</p>			

Title	Order Numbers		
	Base	Prerequisite	Release 3.3
OS/VS2 OLTEP Logic	SY28-0676-3	None	None
OS/VS2 SPL: SYS1.LOGREC Error Recording	GT28-0677 formerly GC28-0677-5	None	None
OS/VS2 SYS1.LOGREC Error Recording Logic	SY28-0678-5	SN28-5080	None
OS/VS2 SPL: System Generation Reference	GC26-3792-8	GD26-6027-0	None
Input/Output Configuration Program Users Guide and Reference	GC28-1027-2	None	None
OS/VS2 SPL: TSO	GC28-0629-3	GN28-2971 GD23-0227-0	None
TSO Command Language Reference	GC28-0646-4	GN28-4699 GN28-4754 GD23-0228-0 GN28-4924	None
OS/VS2 TSO Guide to Writing a Terminal Monitor Program or a Control Program	GC28-0648-3	GD23-0240-0 GN28-2998 GN28-4688 GN28-4749	None
Global Resource Serialization Logic	LT68-1059 formerly LY28-1059-0	LN28-4927	None
SPL: JES2 Installation, Initialization, and Tuning	*****	None	SQ23-0046 formerly SC23-0046-2
SPL: JES2 User Modifications and Macros	*****	None	LT23-0067 formerly LC23-0067-0
Operator's Library: JES2 Commands	*****	None	SQ23-0048 formerly SC23-0048-2
Operator's Library: JES2 Command Syntax	*****	None	ST00-1399 formerly SX23-0008-1
JES2 Logic	*****	None	LY24-6006-1
JES3 Introduction	GT23-0039 formerly GC23-0039-0	GN25-0198	None
JES3 Overview	SC23-0040-0	SN25-0199	None
JES3 SPL: Installation, Planning, and Tuning	SQ23-0041 formerly SC23-0041-3	None	None
JES3 SPL: User Modifications and JES3 Macros	SC23-0042-1	SN28-5047	None
JES3 SPL: Diagnosis	SC23-0043-1	None	None
JES3 Logic	LY24-6005-0	LN25-0197	None

Title	Order Numbers		
	Base	Prerequisite	Release 3.3
JES3 Messages	GQ23-0044 formerly GC23-0044-1	GN25-0200	None
JES3 Operator's Library	SQ23-0045 formerly SC23-0045-1	None	None
JES3 Operator's Library: Reference Summary	ST00-1398-1 formerly SX23-0007-1	None	None



## MVS/SP Release 3.3 Microfiche

Title	Order Numbers		
	Base	Prerequisite	Release 3.3
OS/VS2 Data Areas (for MVS/SP JES3)	LYB8-1055-0	LNB8-4934 LNB8-4995 LNB8-5032	LDB3-0296-0
OS/VS2 Symbol Usage Table (for MVS/SP JES3)	LYB8-1058-0	LNB8-4936 LNB8-4997 LNB8-5034	LDB3-0298-0
OS/VS2 Macro Usage Table (for MVS/SP JES3)	LYB8-1056-0	LNB8-4935 LNB8-4996 LNB8-5033	LDB3-0297-0
OS/VS2 Data Areas (for MVS/SP JES2)	LYB8-1051-0	LNB8-4931 LNB8-4998 LNB8-5029	LDB3-0293-0
OS/VS2 Symbol Usage Table (for MVS/SP JES2)	LYB8-1054-0	LNB8-4933 LNB8-5000 LNB8-5031	LDB3-0295-0
OS/VS2 Macro Usage Table (for MVS/SP JES2)	LYB8-1052-0	LNB8-4932 LNB8-4999 LNB8-5030	LDB3-0294-0

## MVS/SP Release 3.4 Publications

Title	Order Numbers		
	Base	Prerequisite	Release 3.4
Operator's Library: OS/VS2 MVS System Commands	GC28-1031-2	GN28-4975 GN28-5013 GN28-0771	None
OS/VS2 SPL: Initialization and Tuning Guide	GT28-1029 formerly GC28-1029-3	None	None
OS/VS2 SPL: System Management Facilities	GQ28-1030 formerly GC28-1030-2	GN28-4986 GN28-0768 GD23-0234-0 GD23-0235-0 GD23-0239-0	GN28-0874 GN28-0838 GN28-0983 GN28-0937
	GQ28-1030 formerly GC28-1030-3*	None	GN28-0838 GN28-0937
OS/VS2 SPL: Supervisor	GT28-1046 formerly GC28-1046-1	None	None
OS/VS2 Supervisor Services and Macros	GC28-1114-1	None	None
MVS/370 JCL User's Guide	*****	None	GC28-1349-0
MVS/370 JCL Reference	*****	None	GC28-1350-0
OS/VS2 SPL: Job Management	GC28-1303-0	GN28-0971 GN28-0959	None
MVS/370 System Messages Volume 1	*****	None	GC28-1374-2
MVS/370 System Messages Volume 2	*****	None	GC28-1375-2
OS/VS2 Message Library: VS2 System Codes	*****	None	GC38-1008-9
OS/VS Message Library: VS2 Routing and Descriptor Codes	GT00-1710 formerly GC28-1102-3	None	GN28-0872
OS/VS2 SPL: Debugging Handbook, Volume 1	GC28-1047-1	None	GN28-0939 GN28-0993
OS/VS2 SPL: Debugging Handbook, Volume 2	*****	None	GC28-1048-2
OS/VS2 SPL: Debugging Handbook, Volume 3	*****	None	GC28-1049-2
OS/VS2 SPL: MVS Diagnostic Techniques	SQ68-1133 formerly SY28-1133-1	None	SN28-0875
MVS IPCS User's Guide and Reference	GC28-1183-0	None	None
MVS IPCS Messages and Codes	GC28-1182-0	None	None
MVS IPCS Logic and Diagnosis	LY28-1184-0	None	None
* GC28-1030-3 is a minor revision of GC28-1030-2 and incorporates all the TNLs other than GN28-0838 and GN28-0937.			

Title	Order Numbers		
	Base	Prerequisite	Release 3.4
OS/VS2 MVS System Initialization Logic	LQ68-1050 formerly LY28-1050-1	LN28-4982 LN28-5022 LN28-5068	None
OS/VS2 MVS System Logic Library, Volume 1 (See note.)	*****	None	ST00-1708 formerly SY28-0713-10
OS/VS2 MVS System Logic Library, Volume 2	*****	None	LY28-1063-1
OS/VS2 MVS System Logic Library, Volume 3	LT68-1067 formerly LY28-1067-0	LN28-4961 LN28-5017	LN28-0880
OS/VS2 MVS System Logic Library, Volume 4	*****	None	LQ68-1071 formerly LY28-1071-1
OS/VS2 MVS System Logic Library, Volume 5	LY28-1075-0	LN28-5019 LN28-4977	LN28-0881
OS/VS2 MVS System Logic Library, Volume 6	LY28-1079-0	LN28-4984 LN28-5020 LD23-0301-0 LN28-0841	LN28-0941 LN28-0878
	LY28-1079-1*	None	LN28-0878
OS/VS2 MVS System Logic Library, Volume 7	LT68-1083 formerly LY28-1083-0	LN28-5025 LD23-0290-0	LN28-0888
OS/VS2 MVS System Logic Library, Volume 8	LT68-1087 formerly LY28-1087-0	LN28-5026 LN28-5003	LN28-0889
OS/VS2 MVS System Logic Library, Volume 9	*****	None	LQ68-1091 formerly LY28-1091-1
OS/VS2 MVS System Logic Library, Volume 10	LY28-1095-0	LN28-5028	LN28-0877
OS/VS2 MVS System Logic Library, Volume 11	*****	None	LT00-1701 formerly LY28-1099-2
OS/VS2 SPL: Service Aids	GT28-0674 formerly GC28-0674-3	GD23-0122-0 (SU 64) GN28-4686 GD23-0178-2 GD23-0217 GN28-4920 GN28-4944	GN28-0965
Environmental Record Editing and Printing User's Guide and Reference	GC28-1378-0	GN28-5054 GN28-5055	
OS/VS2 SPL: OLTEP	GC28-0675-4	None	None
OS/VS2 I/O Supervisor Logic	LY28-1383-0	None	None
<p>* LY28-1079-1 is a minor revision of LY28-1079-0 and incorporates all the TNLs other than LN28-0878.</p> <p><i>Note:</i> The System Logic Library (SLL) has been revised and reorganized for MVS/SP Release 3. The SLL now contains 11 volumes instead of the previous 7 volumes. Refer to the Preface of each volume to see what information is documented in that volume. Also note that the order numbers for the 11 volumes of the SLL are not consecutive.</p>			

Title	Order Numbers		
	Base	Prerequisite	Release 3.4
OS/VS2 Service Aids Logic	SY28-0643-4	SD23-0131-0 (SU 64) SN28-2912 LD23-0194-2 LN28-4926 LN28-4950	None
OS/VS2 OLTEP Logic	SY28-0676-3	None	None
OS/VS2 SPL: SYS1.LOGREC Error Recording	GT28-0677 formerly GC28-0677-5	LD23-0286	None
OS/VS2 SYS1.LOGREC Error Recording Logic	SY28-0678-5	SN28-5080	None
OS/VS2 SPL: System Generation Reference	GC26-3792-8	GD26-6027-0	None
Input/Output Configuration Program Users Guide and Reference	GC28-1027-2	None	None
OS/VS2 SPL: TSO	GC28-0629-3	GN28-2971 GD23-0227-0	None
TSO Command Language Reference	GC28-0646-4	GN28-4699 GN28-4754 GD23-0228-0 GN28-4924 GD23-0259-0	None
OS/VS2 TSO Guide to Writing a Terminal Monitor Program or a Control Program	GC28-0648-3	GD23-0240-0 GN28-2998 GN28-4688 GN28-4749	None
Global Resource Serialization Logic	LT68-1059 formerly LY28-1059-0	LN28-4927	None
SPL: JES2 Installation, Initialization, and Tuning	*****	None	SC23-0046-3
SPL: JES2 User Modifications and Macros	*****	None	LC23-0067-1
Operator's Library: JES2 Commands	*****	None	SC23-0048-3
Operator's Library: JES2 Command Syntax	*****	None	SX23-0008-2
MVS/370 Message Library: JES2 Messages	*****	None	GC28-1354-0
JES2 Logic	LY24-6006-1	LN28-0813	LN28-0869
JES3 Introduction	*****	None	GC23-0039-1
JES3 Overview	SC23-0040-0	SN25-0199	None
JES3 SPL: Initialization and Tuning	*****	None	SC23-0041-4
JES3 SPL: User Modifications and JES3 Macros	*****	None	LC28-1371-0
JES3 SPL: Diagnosis	*****	None	LC28-1369-0

Title	Order Numbers		
	Base	Prerequisite	Release 3.4
JES3 Logic Library Volume 1: Logic Overview	*****	None	LY28-1507-0
JES3 Logic Library Volume 2: Initialization Logic	*****	None	LY28-1509-0
JES3 Logic Library Volume 3: Job Input Management Logic	*****	None	LY28-1511-0
JES3 Logic Library Volume 4: Job Resource Management Logic	*****	None	LY28-1513-0
JES3 Logic Library Volume 5: Job Scheduling Logic	*****	None	LY28-1515-0
JES3 Logic Library Volume 6: Job Output and Termination Logic	*****	None	LY28-1517-0
JES3 Logic Library Volume 7: Complex Management Logic	*****	None	LY28-1519-0
JES3 Logic Library Volume 8: Spool Data Management Logic	*****	None	LY28-1521-0
JES3 Logic Library Volume 9: JES3 Communications Logic	*****	None	LY28-1523-0
JES3 Logic Library Volume 10: Remote Processing Logic	*****	None	LY28-1525-0
JES3 Logic Library Volume 11: Logic Reference	*****	None	LY28-1527-0
JES3 Messages	*****	None	GC23-0044-2
JES3 Operator's Library	*****	None	SC23-0045-2
JES3 Operator's Library: Reference Summary	*****	None	SX23-0007-2

## MVS/SP Release 3.4 Microfiche

Title	Order Numbers		
	Base	Prerequisite	Release 3.4
OS/VS2 Data Areas (for MVS/SP JES3)	LYB8-1055-0	LNB8-4934 LNB8-4995 LNB8-5032 LDB3-0296-0	LNB8-0895
OS/VS2 Symbol Usage Table (for MVS/SP JES3)	LYB8-1058-0	LNB8-4936 LNB8-4997 LNB8-5034 LDB3-0298-0	LNB8-0897
OS/VS2 Macro Usage Table (for MVS/SP JES3)	LYB8-1056-0	LNB8-4935 LNB8-4996 LNB8-5033 LDB3-0297-0	LNB8-0896
OS/VS2 Data Areas (for MVS/SP JES2)	LYB8-1051-0	LNB8-4931 LNB8-4998 LNB8-5029 LDB3-0293-0	LNB8-0892
OS/VS2 Symbol Usage Table (for MVS/SP JES2)	LYB8-1054-0	LNB8-4933 LNB8-5000 LNB8-5031 LDB3-0295-0	LNB8-0894
OS/VS2 Macro Usage Table (for MVS/SP JES2)	LYB8-1052-0	LNB8-4932 LNB8-4999 LNB8-5030 LDB3-0294-0	LNB8-0893

## MVS/SP Release 3.5 Publications

Title	Order Numbers		
	Base	Prerequisite	Release 3.5
Operator's Library: OS/VS2 MVS System Commands	GC28-1031-2	GN28-4975 GN28-5013 GN28-0771	None
OS/VS2 MVS Initialization and Tuning Guide	*****	None	GC28-1029-4
OS/VS2 SPL: System Management Facilities	*****	None	GC28-1030-4
OS/VS2 SPL: Supervisor	*****	None	GC28-1046-2
OS/VS2 Supervisor Services and Macros	GC28-1114-1	None	None
MVS/370 JCL User's Guide	GC28-1349-0	None	None
MVS/370 JCL Reference	GC28-1350-0	None	None
OS/VS2 SPL: Job Management	GC28-1303-0	GN28-0971 GN28-0959	None
MVS/370 System Messages Volume 1	*****	None	GC28-1374-2
MVS/370 System Messages Volume 2	*****	None	GC28-1375-2
OS/VS Message Library: VS2 System Codes	*****	None	GC38-1008-10
OS/VS Message Library: VS2 Routing and Descriptor Codes	*****	None	GC38-1102-4
MVS/370 Programming Library: Debugging Handbook, Volume 1	*****	None	LC28-1385-0
MVS/370 Programming Library: Debugging Handbook, Volume 2	*****	None	LC28-1386-0
MVS/370 Programming Library: Debugging Handbook, Volume 3	*****	None	LC28-1387-0
MVS/370 Programming Library: Debugging Handbook, Volume 4	*****	None	LC28-1388-0
MVS/370 Programming Library: Debugging Handbook, Volume 5	*****	None	LC28-1389-0
OS/VS2 SPL: MVS Diagnostic Techniques	*****	None	SY28-1133-2
MVS IPCS User's Guide and Reference	GC28-1183-0	None	None
MVS IPCS Messages and Codes	GC28-1182-0	None	None
MVS IPCS Logic and Diagnosis	LY28-1184-0	None	None
OS/VS2 MVS System Initialization Logic	*****	None	LY28-1050-2

Title	Order Numbers		
	Base	Prerequisite	Release 3.5
OS/VS2 MVS System Logic Library, Volume 1 (See note.)	*****	None	SY28-0713-11
OS/VS2 MVS System Logic Library, Volume 2	LY28-1063-1	None	None
OS/VS2 MVS System Logic Library, Volume 3	*****	None	LY28-1067-1
OS/VS2 MVS System Logic Library, Volume 4	*****	None	LY28-1071-2
OS/VS2 MVS System Logic Library, Volume 5	LY28-1075-0	LN28-5019 LN28-4977 LN28-0881	None
OS/VS2 MVS System Logic Library, Volume 6	LY28-1079-1	LN28-0878	None
OS/VS2 MVS System Logic Library, Volume 7	*****	None	LY28-1083-1
OS/VS2 MVS System Logic Library, Volume 8	*****	None	LY28-1087-1
OS/VS2 MVS System Logic Library, Volume 9	*****	None	LY28-1091-2
OS/VS2 MVS System Logic Library, Volume 10	LY28-1095-0	LN28-5028 LN28-0877	LN28-1019
OS/VS2 MVS System Logic Library, Volume 11	*****	None	LY28-1099-3
OS/VS2 SPL: Service Aids	*****	None	GC28-0674-4
Environmental Record Editing and Printing User's Guide and Reference	GC28-1378-0	GN28-5054 GN28-5055	
OS/VS2 SPL: OLTEP	GC28-0675-4	None	None
OS/VS2 I/O Supervisor Logic	LY28-1383-0	None	LN28-1088
OS/VS2 Service Aids Logic	*****	None	LY28-1175-0
<p><i>Note:</i> The System Logic Library (SLL) has been revised and reorganized for MVS/SP Release 3. The SLL now contains 11 volumes instead of the previous 7 volumes. Refer to the Preface of each volume to see what information is documented in that volume. Also note that the order numbers for the 11 volumes of the SLL are not consecutive.</p>			



Title	Order Numbers		
	Base	Prerequisite	Release 3.5
OS/VS2 OLTEP Logic	SY28-0676-3	SN28-5070	None
OS/VS2 SPL: SYS1.LOGREC Error Recording	*****	None	GC28-0677-6
OS/VS2 SYS1.LOGREC Error Recording Logic	SY28-0678-5	SN28-5080	None
OS/VS2 SPL: System Generation Reference	GC26-3792-8	GD26-6027-0	None
Input/Output Configuration Program Users Guide and Reference	GC28-1027-2	None	None
OS/VS2 SPL: TSO	GC28-0629-3	GN28-2971 GD23-0227-0	None
TSO Command Language Reference	GC28-0646-4	GN28-4699 GN28-4754 GD23-0228-0 GN28-4924 GD23-0259-0	None
OS/VS2 TSO Guide to Writing a Terminal Monitor Program or a Control Program	GC28-0648-3	GD23-0240-0 GN28-2998 GN28-4688 GN28-4749	None
Global Resource Serialization	GC28-1062-0	LN28-0953	None
Global Resource Serialization Logic	*****	None	LY28-1059-1
SPL: JES2 Installation, Initialization, and Tuning	SC23-0046-3	SN28-1007	None
SPL: JES2 User Modifications and Macros	LC23-0067-1	None	None
Operator's Library: JES2 Commands	SC23-0048-3	SN28-1017	None
Operator's Library: JES2 Command Syntax	SX23-0008-2	None	None
MVS/370 Message Library: JES2 Messages	GC28-1354-0	None	None
JES2 Logic	LY24-6006-1	LN28-0813 LN28-0869	None
JES3 Introduction	GC23-0039-1	GN25-0198	None
JES3 Overview	SC23-0040-0	SN25-0199	None
JES3 SPL: Initialization and Tuning	SC23-0041-4	None	None
JES3 SPL: User Modifications and JES3 Macros	LC28-1371-0	None	None
JES3 SPL: Diagnosis	LC28-1369-0	None	None
JES3 Logic Library Volume 1: Logic Overview	LY28-1507-0	None	None
JES3 Logic Library Volume 2: Initialization Logic	LY28-1509-0	None	None
JES3 Logic Library Volume 3: Job Input Management Logic	LY28-1511-0	None	None

Title	Order Numbers		
	Base	Prerequisite	Release 3.5
JES3 Logic Library Volume 4: Job Resource Management Logic	LY28-1513-0	None	None
JES3 Logic Library Volume 5: Job Scheduling Logic	LY28-1515-0	None	None
JES3 Logic Library Volume 6: Job Output and Termination Logic	LY28-1517-0	None	None
JES3 Logic Library Volume 7: Complex Management Logic	LY28-1519-0	None	None
JES3 Logic Library Volume 8: Spool Data Management Logic	LY28-1521-0	None	None
JES3 Logic Library Volume 9: JES3 Communications Logic	LY28-1523-0	None	None
JES3 Logic Library Volume 10: Remote Processing Logic	LY28-1525-0	None	None
JES3 Logic Library Volume 11: Logic Reference	LY28-1527-0	None	None
JES3 Messages	GC23-0044-2	None	None
JES3 Operator's Library	SC23-0045-2	None	None
JES3 Operator's Library: Reference Summary	SX23-0007-2	None	None

## MVS/SP Release 3.5 Microfiche

Title	Order Numbers		
	Base	Prerequisite	Release 3.5
OS/VS2 Data Areas (for MVS/SP JES3)	LYB8-1055-0	LNB8-4934 LNB8-4995 LNB8-5032 LDB3-0296-0 LNB8-0895	LNB8-1023
OS/VS2 Symbol Usage Table (for MVS/SP JES3)	LYB8-1058-0	LNB8-4936 LNB8-4997 LNB8-5034 LDB3-0298-0 LNB8-0897	LNB8-1025
OS/VS2 Macro Usage Table (for MVS/SP JES3)	LYB8-1056-0	LNB8-4935 LNB8-4996 LNB8-5033 LDB3-0297-0 LNB8-0896	LNB8-1024
OS/VS2 Data Areas (for MVS/SP JES2)	LYB8-1051-0	LNB8-4931 LNB8-4998 LNB8-5029 LDB3-0293-0 LNB8-0892	LNB8-1020
OS/VS2 Symbol Usage Table (for MVS/SP JES2)	LYB8-1054-0	LNB8-4933 LNB8-5000 LNB8-5031 LDB3-0295-0 LNB8-0894	LNB8-1022
OS/VS2 Macro Usage Table (for MVS/SP JES2)	LYB8-1052-0	LNB8-4932 LNB8-4999 LNB8-5030 LDB3-0294-0 LNB8-0893	LNB8-1021



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